HANDBOUND
AT THE
UNIVERSITY OF
TORONTO PRESS

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

http://www.archive.org/details/monistquart05hegeuoft

8961
940
I.

THE MONIST

A

QUARTERLY MAGAZINE

VOLUME V

37166
13/12/95

CHICAGO
THE OPEN COURT PUBLISHING CO.
1894–95

B
1
M7
v.5

Copyright by
The Open Court Publishing Co
1895.

CONTENTS OF VOLUME V.

ARTICLES AND AUTHORS.

PAGE

Abbot, Francis E. The Advancement of Ethics 192

Alive, To Be, What Is It? By Edmund Montgomery 166

Ball, Robert Stawell. The Unseen Universe 553

Bonnet's Theory of Evolution. By C. O. Whitman 412

Bonney, C. C. The World's Parliament of Religions 321

Buddhism and Christianity. Editor 65

Carus, Paul. Buddhism and Christianity, 65; The Life of Issa, 116; Debate on Christian Missions, 274; Mind Not a Storage of Energy—In Reply to Mr. Lester F. Ward, 282; The World's Religious Parliament Extension, 345; The Late Professor Romanes's Thoughts on Religion, 385; The Significance of Music, 401; The Key to the Riddle of the Universe, 408; De Rerum Natura, Appendix to No. 2; The Metaphysical x in Cognition, 510.

Converse, C. Crozat. Music's Mother-Tone and Tonal Onomatopy 375

Conway, Moncure D. Ought the United States Senate to Be Reformed? 223

De Rerum Natura. Editor. Appendix to No. 2.

Digby, Emilia. In Defence of True Music 610

Energy, On the Principle of the Conservation of. By Ernst Mach 22

Energy, The Natural Storage of. By Lester F. Ward 247

Ethics, The Advancement of. By Francis E. Abbot 191

Evolution, Organic, The Present Problems of. By E. D. Cope 563

Evolution, The Theory of, and Social Progress. By Joseph Le Conte 481

Fawcett, E. Douglas. The Well-Springs of Reality, 363. The Key to the Riddle of the Universe 607

Gandhi, Virchand R. Debate on Christian Missions 268

Gates, Elmer. The Science of Mentation, and Some New General Methods of Psychologic Research 574

Holst, H. von. Ought the United States Senate to Be Abolished? 1

Le Conte, Joseph. The Theory of Evolution and Social Progress 481

Longevity and Death. (A Posthumous Essay.) George J. Romanes 161

PAGE

Mach, Ernst. On the Principle of the Conservation of Energy 22
Materialism Untenable. By A. E. Dolbear 501
Mentation, The Science of, and Some New General Methods of Psychologic Research. By Elmer Gates 574
Metaphysical *x* in Cognition, The. Editor 510
Missions, Christian: A Debate Before the Nineteenth Century Club of New York. By J. M. Thoburn, Virchand R. Gandhi, and Paul Carus, 264, 268, 274
Montgomery, Edmund. To Be Alive, What Is It? 166
Morgan, C. Lloyd. A Piece of Patchwork 354
Motion, On the Nature of. By J. W. Powell 55
Music, In Defence of True. By Emilia Digby 610
Music, The Significance of. Editor 401
Music's Mother-Tone and Tonal Onomatopy. By C. Crozat Converse 375
Patchwork, A Piece of. By C. Lloyd Morgan 354
Powell, J. W. On the Nature of Motion, 55; The Soul. A Poem. Appendix to No. 3.
Reality, The Well-Springs of. By E. Douglas Fawcett 363
Religions, The World's Parliament of. By C. C. Bonney 321
Religious Parliament Extension, The World's. Editor 345
Riddle of the Universe, The Key to the. Editor. 408. The Same. By E. Douglas Fawcett 607
Romanes, George J. Longevity and Death. (A Posthumous Essay.) 161
Romanes, The Late Professor, his Thoughts on Religion. Editor 385
Senate, Ought the United States, to Be Abolished? By H. von Holst, 1.—Ought the United States Senate to be Reformed? By Moncure D. Conway 223
Soul, The. A Poem. By J. W. Powell. Appendix to No. 3.
Thoburn, J. M. Debate on Christian Missions 264
Thought, On the Nature of. By Thomas Whittaker 104
Unseen Universe, The. By Robert Stawell Ball 553
Ward, Lester F. The Natural Storage of Energy 247
Whitman, C. O. Bonnet's Theory of Evolution 412
Whittaker, Thomas. On the Nature of Thought 104

LITERARY CORRESPONDENCE.

France. By Lucien Arréat 110, 427, 598

BOOK REVIEWS.

Adam, M. Ch. *La philosophie en France (Première moitié du XIX. siècle)* 110
Alaux, J. E. *Philosophie morale et politique* 112
Arréat, Lucien. *Mémoire et imagination* 450
As Others Saw Him. A Retrospect. A. D. 54. Anonymous 619

PAGE

Aubry, Paul. *La contagion du meurtre, étude d'anthropologie criminelle*..... 112

Baldwin, James Mark. *Mental Development in the Child and the Race*..... 633

Balfour, Arthur James. *The Foundations of Belief*..... 614

Bastian, A. *Ideale Welten in Wort und Bild.* Etc..... 450

Benedikt, Moriz. *Hypnotismus und Suggestion*..... 148

Binet, Alfred. *Psychologie des grands calculateurs et joueurs d'échecs*... 142

Binet, Philippe, Courtier, and V. Henri. *Introduction à la psychologie expérimentale*..... 430

Boirac, M. E. *L'idée du phénomène*..... 428

Bonhöffer, Adolf. *Die Ethik des Stoikers Epictet*..... 149

Broglie, M. le duc de. *Address on Taine*..... 598

Brunschwieg, M. Léon. *Spinoza*..... 442

Busse, Ludwig. *Philosophie und Erkenntnisstheorie*..... 625

Cajori, Florian. *A History of Mathematics*..... 629

Carstanjen, Friedrich. *Richard Avenarius' biomechanische Grundlegung der neuen allgemeinen Erkenntnisstheorie, eine Einführung in die "Kritik der reinen Erfahrung"*..... 627

Conta, Basil. *Théorie sur l'ondulation universelle, essai sur l'évolution*..... 441

Conybeare, F. C. *The Apology and Acts of Apollonius and Other Monuments of Early Christianity*..... 133

Corre, A. See p. 112.

Cox, W. L. Page. *The Scientific Study of Theology*..... 123

Danville, Gaston. *La psychologie de l'amour*..... 431

Deussen, Paul. *Allgemeine Geschichte der Philosophie*..... 456

Dumas, Georges. *Les états intellectuels dans la mélancolie*..... 441

Dumesnil, Alfred. *Libre*..... 606

Duboc, Julius. *Psychologie der Liebe*..... 431

Durkheim, Emile. *Les règles de la méthode sociologique*..... 601

Dvivedi, Manilal N. Translation of the *Mândûkyopanishad*, etc..... 628

Eckoff, William J. *Kant's Inaugural Dissertation of 1770*..... 152

Eeden, F. Van, and A. W. Van Renterghem. *Psycho-thérapie*..... 452

Falckenberg, Richard. *History of Modern Philosophy from Nicholas of Cusa to the Present Time*..... 120

Fawcett, Edward Douglas. *The Riddle of the Universe*..... 315

Forel, August. *Gehirn und Seele*..... 636

Garbe, Richard. *Die Sâmkhya-Philosophie*..... 126

Giessler, Carl Max. *Wegweiser zu einer Psychologie des Geruches*..... 636

Godfernaux, André. *Le sentiment et la pensée et leurs principaux aspects physiologiques*..... 432

Grosse, Ernst. *Die Anfänge der Kunst*..... 114

Haeckel, Ernst. *Systematische Phylogenie der Protisten und Pflanzen*..... 451

Hertz, Heinrich. *Die Principien der Mechanik*..... 464

PAGE

Hill, David Jayne. *Genetic Philosophy* 621

Hirth, Georg. *Les localisations cérébrales en psychologie (Pourquoi sommes-nous distraits?)* 442

Illingworth, J. R. *Personality, Human and Divine* 473

Izoulet, Jean. *La cité moderne, metaphysique de la sociologie* 603

Kauffmann, Max. *Immanente Philosophie* 472

Kleffler, M. *Science et conscience, ou théorie de la force progressive* 430

Le Bon, G. *Lois psychologiques de l'évolution des peuples* 438

Letourneau, Ch. *L'évolution littéraire dans les diverses races humaines* 114

Lévy-Bruhl, M. *Philosophie de Jacobi* 442

Lockyer, J. Norman. *The Dawn of Astronomy. A Study of the Temple-Worship and Mythology of the Ancient Egyptians* 300

Mabilleau, M L. *Victor Hugo* 113

Maccunn, John. *Ethics of Citizenship* 146

Marshall, Henry Rutgers. *Æsthetic Principles* 637

Martin, Francelon. *La perception extérieure et la science positive* 440

Milhaud, M. G. *Leçons sur les origines de la science grecque* 118

Morando, G. *Lo Scetticismo e Gaetano Negri* 151

Morgan, C. Lloyd. *An Introduction to Comparative Psychology*, 443; *Psychology for Teachers* 630

Mosso, A. *La fatigue intellectuelle et physique* 111

Müller, F. Max. *Three Lectures on the Vedanta Philosophy* 148

Näcke, Paul. *Verbrechen und Wahnsinn beim Weibe* 453

Natorp, Paul. *Religion innerhalb der Grenzen der Humanität. Ein Kapitel zur Grundlegung der Sozialpädagogik* 131

Naville, Ernest. *Définition de la philosophie* 429

Nichols, Herbert. *Our Notions of Number and Space* 147

Novicow, J. *Les gaspillages des sociétés modernes* 439

Oldenberg, Hermann. *Die Religion des Veda* 289

Ormond, Alexander T. *Basal Concepts in Philosophy. An Inquiry Into Being, Non-Being, and Becoming* 121

Osborn, Henry Fairfield. *From the Greeks to Darwin. An Outline of the Development of the Evolution Idea* 309

Pillon, M. F. *L'année philosophique* 113

Pioger, Julien. *La vie sociale, la morale et le progrès* 436

Queyrat, Fr. *L'abstraction et son rôle dans l'éducation intellectuelle* 442

Rehmke, Johannes. *Lehrbuch der allgemeinen Psychologie*, 449; *Unsere Gewissheit von der Aussenwelt. Ein Wort an die Gebildeten unserer Zeit* 453

Renouvier, Ch. *Victor Hugo le poète* 113

Renterghem, A. W. Van, and F. Van Eeden. *Psycho-thérapie* 452

Roberty, E. de. *Auguste Comte et Herbert Spencer, nouvelle contribution à l'histoire des idées philosophiques au XIX. siècle* 143, 427

PAGE
Salvadori, Carlo. *Prenozioni di Filosofia Scientifica* 625
Sayce, H. A. *The Higher Critics and the Verdict of the Monuments* 293
Schellwien, Robert. *Der Geist der neueren Philosophie* 624
Schwarz, Hermann. *Was will der kritische Realismus? Eine Antwort an Herrn Professor Martius in Bonn* 150
Scripture, Edward W. *Studies from the Yale Psychological Laboratory* 632
Sergi, G. *Dolore e Piacere, Storia Naturale dei Sentimenti* 150
Sheldon, W. L. *Story of the Life of Jesus* 619
Sigwart, Christoph. *Logic* 622
Sorel, M. Albert. *Address on Taine* 598
Spaulding, Frank E. *Richard Cumberland als Begründer der englischen Ethik* 152
Steiner, Rudolf. *Die Philosophie der Freiheit* 150
Substance and Its Attributes. Anonymous 632
Taine. Criticisms of his work 598
Tannery, M. Paul. *Pour l'histoire de la science hellène (de Thalès à Empédocle)* 110
Tarde, G. *Logique sociale* 434
Tescanu, M. See Basil Conta.
Twardowski, Kasimir. *Zur Lehre vom Inhalt und Gegenstand der Vorstellungen* 149
Verworn, Max. *Allgemeine Physiologie* 628
Watson, John. *Comte, Mill, and Spencer. An Outline of Philosophy* 623
Webb, Sidney and Beatrice. *The History of Trades Unionism* 139
Wenley, R. M. *Aspects of Pessimism* 145
Willey, Arthur. *Amphioxus and the Ancestry of the Vertebrates* 313
Wundt, Wilhelm. *Lectures on Human and Animal Psychology.* Translated by J. E. Creighton and E. B. Titchener 631

PERIODICALS 153–160, 318–320, 474–480, 638–640

VOL. 5. No. 4. JULY, 1895.

THE MONIST

A QUARTERLY MAGAZINE.

Editor: DR. PAUL CARUS. *Associates:* EDWARD C. HEGELER, MARY CARUS.

CONTENTS:

THE THEORY OF EVOLUTION AND SOCIAL PROGRESS. PAGE
PROF. JOSEPH LE CONTE - - - - - - - - - 481

MATERIALISM UNTENABLE.
PROF. A. E. DOLBEAR - - - - - - - - - 501

THE METAPHYSICAL *x* IN COGNITION.
EDITOR - - - - - - - - - - - - - - 510

THE UNSEEN UNIVERSE.
SIR ROBERT STAWELL BALL - - - - - - - - 553

THE PRESENT PROBLEMS OF ORGANIC EVOLUTION.
PROF. E. D. COPE - - - - - - - - - - 563

THE SCIENCE OF MENTATION.
ELMER GATES - - - - - - - - - - - 574

LITERARY CORRESPONDENCE.
France. LUCIEN ARRÉAT - - - - - - - - - - 598

CRITICISMS AND DISCUSSIONS.
"The Key to the Riddle of the Universe." E. Douglas Fawcett 607
In Defence of True Music. Emilia Digby - - - - - - 610

BOOK REVIEWS - - - - - - - - - - - - - - 614

The Foundations of Belief. By the *Rt. Hon. Arthur James Balfour*, p. 614.—Story of the Life of Jesus. By *W. L. Sheldon*. As Others Saw Him, p. 619.—Genetic Philosophy. By *David Jayne Hill*, p. 621.—Logic. By *Dr. Christoph Sigwart*, translated by *Helen Dendy*, p. 622.—Comte, Mill, and Spencer. An Outline of Philosophy. By *John Watson*, p. 623.—Der Geist der neueren Philosophie. By *Robert Schellwien*, p. 624.—Prenozioni di Filosofia Scientifica. By *Prof. Carlo Salvadori*, p. 625.—Philosophie und Erkenntnisstheorie. By *Dr. Ludwig Busse*, p. 625 —Richard Avenarius' biomechanische Grundlegung der neuen allgemeinen Erkenntnisstheorie, eine Einführung in die "Kritik der reinen Erfahrung." By *Friedrich Carstanjen*, p. 627. —The Mândûkyopanishad. Translated by *Manilal N. Dvivedi*, p. 628.—Allgemeine Physiologie. By *Dr. Max Verworn*, p. 628.—A History of Mathematics. By *Florian Cajori*, p. 629.—Psychology for Teachers. By *C. Lloyd Morgan*, p. 630.—Lectures on Human and Animal Psychology. By *Wilhelm Wundt*, translated by *J. E. Creighton* and *E. B. Titchener*, p. 631.—Studies from the Yale Psychological Laboratory. By *Edward W. Scripture*, p. 632.—Substance and Its Attributes, p. 632.—Mental Development in the Child and the Race. By *James Mark Baldwin*, p. 633.—Gehirn und Seele. By *August Forel*, p. 636.—Wegweiser zu einer Psychologie des Geruches. By *Carl Max Giessler*, p. 636.—Æsthetic Principles. By *Henry Rutgers Marshall*, p. 637.

PERIODICALS - - - - - - - - - - - - - - 638

CHICAGO:
THE OPEN COURT PUBLISHING COMPANY.
1895.

Copyright by

The Open Court Publishing Co.

1895.

VOL. 5. No. 1. OCTOBER, 1894

THE MONIST

A QUARTERLY MAGAZINE.

Editor: DR. PAUL CARUS. *Associates:* EDWARD C. HEGELER, MARY CARUS.

CONTENTS:

PAGE

OUGHT THE UNITED STATES SENATE TO BE ABOLISHED?
PROF. H. VON HOLST - - - - - - - - - - 1

ON THE PRINCIPLE OF THE CONSERVATION OF ENERGY.
PROF. ERNST MACH - - - - - - - - - - 22

ON THE NATURE OF MOTION.
MAJOR J. W. POWELL - - - - - - - - - - 55

BUDDHISM AND CHRISTIANITY.
EDITOR - - - - - - - - - - - - - - 65

ON THE NATURE OF THOUGHT.
THOMAS WHITTAKER - - - - - - - - - - 104

LITERARY CORRESPONDENCE.
France. LUCIEN ARRÉAT - - - - - - - - - - 110

CRITICISMS AND DISCUSSIONS.
The Life of Issa. EDITOR - - - - - - - - - - - 116

BOOK REVIEWS - - - - - - - - - - - - - - 120

History of Modern Philosophy. By *Richard Falckenberg*, p. 120.—Basal Concepts in Philosophy. By *Alexander T. Ormond, Ph. D.*, p. 121.—The Scientific Study of Theology. By *W. L. Page Cox, M. A.*, p. 123.—Die Sâmkhya-Philosophie. By *Richard Garbe*, p. 126.—Religion innerhalb der Grenzen der Humanität. By *Paul Natorp*, p. 131.—The Apology and Acts of Apollonius and Other Monuments of Early Christianity. By *F. C. Conybeare, M. A.*, p. 133.—Matter, Ether, and Motion. By *A. E. Dolbear, Ph. D.*, p. 135.—The History of Trade Unionism. By *Sidney* and *Beatrice Webb*, p. 139.—Psychologie des grands calculateurs et joueurs d'échecs. By *Alfred Binet*, p. 142.—August Comte et Herbert Spencer. By *E. de Roberty*, p. 143.—Aspects of Pessimism. By *R. M. Wenley*, p. 145.—Ethics of Citizenship. By *John Maccunn, M. A.*, p. 146.—Our Notions of Number and Space. By *Herbert Nichols, Ph. D.*, p. 147.—Three Lectures on the Vedânta Philosophy. By *F. Max Müller, K. M.*, p. 148.—Hypnotismus und Suggestion. By *Prof. Dr. Moriz Benedikt*, p. 148.—Zur Lehre vom Inhalt und Gegenstand der Vorstellungen. By *Dr. Kasimir Twardowski*, p. 149.—Die Ethik des Stoikers Epictet. By *Adolf Bonhöffer*, p. 149.—Was will der kritische Realismus? By *Hermann Schwarz*, p. 150.—Die Philosophie der Freiheit. By *Dr. Rudolf Steiner*, p. 150.—Dolore e Piacere, Storia Naturale dei Sentimenti. By *G. Sergi*, p. 150.—Lo Scetticismo e Gaetano Negri. By *G. Morando*, p. 151.—Kant's Inaugural Dissertation of 1770. By *William J. Eckoff*, p. 152.—Richard Cumberland als Begründer der englischen Ethik. By *Frank E. Spaulding.*

PERIODICALS - - - - - - - - - - - - - - - 153

The Psychological Review, p. 153.—The Philosophical Review, p. 153.—The New World, p. 154.—Philosophische Monatshefte, p. 154.—The American Journal of Psychology, p. 156.—International Journal of Ethics, p. 156.—Mind, p. 157.—Philosophisches Jahrbuch, p. 157.—Zeitschrift für Psychologie und Physiologie der Sinnesorgane, p. 158.—Vierteljahrsschrift für wissenschaftliche Philosophie, p. 159.—Zeitschrift für Philosophie und philosophische Kritik, p. 159.—Revue Philosophique, p. 159.—Revue de Métaphysique et de Morale, p. 160.—The Rikugo Zassi, p. 160.

CHICAGO:
THE OPEN COURT PUBLISHING COMPANY.
1894.

Copyright by

The Open Court Publishing Co

1894.

VOL. V. OCTOBER, 1894. NO. 1.

THE MONIST.

OUGHT THE UNITED STATES SENATE TO BE ABOLISHED?[1]

WHEN the gigantic intellect of Napoleon began to stagger and reel under the weight of his successes, he is said to have boasted that he would make his dynasty the oldest in Europe. In 1787 this Republic was the youngest State. To-day it is in a most essential respect by far the oldest: its constitution—if the word be understood in its strict and proper sense—antedates by many years all other constitutions. If this had been foretold by a prophet, when on the 25th of May, eleven days after the appointed time, the "convention of delegates . . . . for the sole and express purpose of revising the Articles of Confederation" could at last proceed to business by organising itself, it would have appeared a wilder prediction than the mad threat of the demoniacal Corsican. "We may indeed, with propriety, be said to have reached almost the last stage of national humiliation. There is scarcely anything that can wound the pride, or degrade the character of an independent nation, which we do not experience . . . . what indication is there of national disorder, poverty, and insignificance, that could befall a community so peculiarly blessed with natural advantages as we are, which does not form a part of the dark catalogue of our public misfortunes?" Thus Hamilton characterised in the *Federalist* (No. XV, Dawson's edit.) the actual condition of things, while the people held the adoption or re-

[1] Oration delivered on the Fourth of July at the University of Chicago.

jection of the work of the federal convention under advisement, and Washington endorsed again and again this harsh judgment to its fullest extent. Luther Martin, however, was of opinion that the people would seal their own doom and that of their posterity by accepting the proffered gift of the convention. He wrote: "I would reduce myself to indigence and poverty; and those who are dearer to me than my own existence I would intrust to the care and protection of that Providence who hath so kindly protected myself,—if on *those terms only* I could procure my country to reject those chains which are forged for it." (*Elliot*, I, 389.) His warning was not heeded. The people deliberately fastened the chains to their limbs,—they and their posterity have worn them one hundred and five years glorying in them the longer the more,—the chains, in spite of all their alleged and real flaws, have withstood the strain of the greatest civil war recorded in history and grown infinitely stronger than before,—they have been worked as a drag-net hauling to a thinly settled coast-strip a whole continent,—and in wearing them and by wearing them, the people have pushed themselves ever more vigorously into the very front rank of the leading nations of the earth as to everything that renders life worth living for. Surely, the people of the United States have a right to say, and the nations of the earth ought to say with them: would that such chains had been forged more frequently. If the people of the United States ever cease to say so—to say so not merely with their lips, but from the very depth of their hearts and with full consciousness of its whole import, they will have forfeited the right to celebrate the Fourth of July. On the Fourth of July their forefathers merely proclaimed their right to be free and independent and the intention to assert the right; and by a seven year's war they vindicated this step to the extent of proving their ability to conquer independence. This, however, was only the first and the easier half of the task they had assumed. Independent and free are not equivalent terms, and unless they proved themselves capable of becoming and remaining free, their making themselves independent was a wrong done to themselves. The prerequisite of this proof, however, was a much harder and grander victory—a victory over them-

selves. This they achieved in the adoption of the Constitution. Therefore only by the adoption of the Constitution was the Fourth of July rendered a festive day for humankind.

That the handful of men at Philadelphia, anxiously devising behind closed doors the means to infuse enduring vitality into the federative Republic, must forever be counted among the greatest lawgivers known to history, is therefore no more an arguable question. In the nature of things, there is but one adequate test of constitutions—success. Their work has stood this test over a century. Nothing can undo this fact, and consequently, whatever the future may have in store for this Republic, their names are indelibly inscribed in the imperishable plates of history as sages and benefactors of mankind. But let us beware lest justice to them mislead us into injustice towards others. They could only devise the proper means for realising the great possibilities offered by the circumstances. Unless the people had sufficient discernment to see that they had planned wisely, and had, moreover, all the qualities required for applying the proper means in the proper manner, they had labored in vain. The realisation of the possibilities depended altogether on the people. This is a trite truth, but a truth of tremendous import. To lose sight of it, is to vow the country to perdition. There is no surer way to bring it about than to erect the Constitution into a fetish, expecting from it safety and prosperity so long as incense is offered to it. Though the Constitution is a master-work, in itself it is of no more use than an armor wrought of gossamer. Only so far as the people vitalise it in the proper manner by what they do and by what they abstain from doing, is it a guaranty that the future will correspond to the past. The history of the Union during the years preceding the adoption of the Constitution is, however, irrefutable proof that it will not do to invert the proposition. It would be midsummer madness to assert that as long as the people are all right, it is indifferent what their Constitution is. While it is the immortal glory of the past generations to have made the Constitution a success hardly equalled by any other and certainly surpassed by none, the Constitution has to an incalculable degree been instrumental in rendering the people capa-

ble of doing it. To indulge in rash criticisms, paving the way for a spirit of impatient and venturesome innovation, is, therefore, no less a danger than erecting the Constitution into a fetish. To the happy blending of steadfast and conscious conservatism with determined, but level-headed and prudent progressiveness, as described by Madison in No. XIV of the *Federalist*, do the American people owe their greatness. If this ceases to be the distinguishing trait of the national character, the republic has passed its zenith and is gliding down on an inclined plane, though every year add a million to its inhabitants and a hundred millions to its wealth.

I am confident that to-day an overwhelming majority of the American people will still readily assent to these assertions. But is the number of those not increasing with alarming rapidity who, in one respect or another, do so only "in the abstract"—as they used to say in the old slavery days? To enumerate and discuss all these signs of the times would require days. I must confine myself to calling attention to but one—from certain points of view, in my opinion, the most characteristic as well as the most startling one.

Whether it be justified or not, it is an undeniable and patent fact that the federal Senate has of late years steadily lost ground in the public esteem. By the spectacle offered by it while the repeal of the purchasing clause of the Sherman law was at issue and by its attitude in regard to the revision of the tariff, with the incidental revelations, it has succeeded in arousing an odium, which at any previous period of the country's history would have appeared an utter impossibility. Not only individual Senators have been visited with the keenest censures, but the Senate has been held up by many writers as a fit object of indignation and contempt. Threats that, if it did not mend its ways, it would surely bring down upon itself the fate which would unquestionably overtake the British House of Lords in a near future, have not been uncommon. Others, remembering how difficult the Constitution rendered the fulfilment of this threat, have at least expressed a lively regret that this anachronism, bent upon becoming ever more and more a stupendous failure, could not be consigned to the historical lumber-room. Assuming that all these numerous writers really thought what they wrote, the academi-

cal expressions of their personal opinions would by this time certainly have taken shape in an earnest and systematic political agitation, if the formidable obstacle of the last clause of Article V of the Constitution was not in the way. But though the obstacle is formidable, it is not insurmountable. If ever a large majority of the American people should become fully convinced that the Senate ought to be abolished, this clause will not prevent its being done. In spite of the probable protests of the minority, the majority will then decide that the clause has no reference to this question, and if unanimity of the States be not required, an amendment to this effect could be carried like any other amendment. The clause does not impose the incubus of the Senate *in perpetuum* upon the American people. It merely renders a change of its composition practically impossible, while it is allowed to exist. *Sit ut est, aut non sit*, is the imperative decree. Whosoever is with Mr. Moncure D. Conway of opinion "that in our Senate are historically embodied the most antiquated principle of State sovereignty, . . . the 'rotten borough' principle, the peerage principle, and the base attempt to fetter posterity to these unrepublican and irrational principles, by all of which the United States is held far behind Western Europe in constitutional civilisation," (*The Open Court*, March 15, 1894,) can therefore not consistently hold (with him) that "the entire abolition of the Senate 'does not come' within the range of practical politics." Irrespective of what the chances of success during his lifetime might be, he owes it to himself, as a good patriot, to exert himself to the utmost to have this vicious receptacle of "American snobbery" rased to the ground. Nor—as I shall try to prove later on—is the certainty of the futility of all such exertions for some time to come a valid reason for refraining from a serious examination of the question, whether he and those who more or less agree with him, are right in asserting that the Senate is a pernicious incubus fastened upon the republic by the shortsightedness, the narrow prejudices, and the self-seeking provincialism of the authors of the Constitution.

Logical gymnastics on the field of politics have been for generations the most keenly relished intellectual sport of the American

people, but as a rule their mistaking them for statesmanship has been merely apparent. They have been greatly prone to prop their eminently realistic statecraft with subtle theorising and displayed great skill in this not always harmless art. But their inborn realism and vigorous common sense have most effectively guarded them against allowing themselves to be wafted on by the treacherous winds of plausible theories. Unless they have sadly changed in this respect they will also, as to the question in hand, not accept as satisfactory an answer furnished by theoretical deductions and conclusions, but look squarely at the hard facts, remembering that "in political arithmetic, two and two do not always make four." (*The Federalist*, No. XXI.)

First in order among the pertinent facts stands the historical genesis of the Senate. Mr. Conway writes as to this:

"The Constitution of 1787 was really a treaty between thirteen sovereigns, the smaller empires refusing to unite unless their inherited supremacies were secured the power to overrule the voice of the nation. This was the real foundation of the Senate. But in the discussions of the Convention (1787) that doctrine of sovereignty . . . was veiled, though the veil was as discreditable as the motive concealed. The necessity being first of all to get the second Legislature established in the Constitution, it was done with an innocent air, and without discussion, on the mere statement that England had two Houses, and that two Houses had always proved favorable to liberty. . . . But worse remained. When the subject of disproportionate representation in the Senate came before the Convention, it was supported as a principle only [!] on the ground that in the British Parliament small places with little population were represented equally with the largest constituencies. . . . Furthermore, besides being 'in the European fashion' . . . it [the Senate] has been as a fashion repeated in all the States."

Mr. Conway is a historian and must be presumed to be familiar with the original sources bearing upon the subject. It would, however, be hard to find a more glaring perversion of the plain historical facts. That it is not a wilful falsification, goes without saying. Mr. Conway is one of those historians who, as to certain questions, are constitutionally unable to correctly see the contents of their documents. There is such a thing as historical color-blindness. Put any amount of green before them, to them it will be gray or red.

There was nothing whatever "veiled" about this question in

the Convention. The third of Randolph's "resolutions"—the first plan submitted to the Convention and furnishing the original basis for its discussions—read thus: "Resolved, that the national Legislature ought to consist of two branches." Randolph was a delegate of Virginia, at that time the foremost State of the Union. To suppose that his resolution concealed the sinister intention to clear the way for the "rotten borough system," is, therefore, to suppose a self-evident absurdity.—Article II of Charles Pinckney's plan, submitted the same day to the Convention, read thus: "The legislative power shall be vested in a Congress, to consist of two separate Houses; one to be called the House of Delegates, and the other the Senate." Pinckney was a delegate of South Carolina, and South Carolina also did not think so meanly either of her actual or of her prospective rank in the Union that she can be suspected of the clandestine purpose to prepare a snug berth for herself in the quality of rotten borough. In the committee of the whole, states Madison in his *Debates in the Federal Convention*, Randolph's third resolution "was agreed to without debate or dissent, except that of Pennsylvania,—given probably from complaisance to Dr. Franklin, who was understood to be partial to a single House of Legislation." (*Elliot*, V, 135.) Three weeks later Pennsylvania, too, gave in its adhesion. Thus, if Mr. Conway's assertions be true, we have the odd spectacle of *all* the States conspiring to "veil" their unanimous intention to smuggle into the Constitution "the rotten borough system," which the larger States afterwards so strenuously contended against. What strange things men will do, when they are pursuing "base" projects.

There is, in fact, but one veil in this case and that is drawn over Mr. Conway's eyes. He pins it to his cap with the erroneous assumption that the States have "as a fashion repeated" the federal Senate. That is hitching the cart before the horse. It is repeatedly and explicitly stated in the debates of the convention that it repeated the "fashion" set by all the States with the exception of Pennsylvania. "In two parts," said Mason of Virginia, "he was sure it (the mind of the people of America) was well settled,—first, in an attachment to republican government; secondly, in an attachment

to more than one branch in the Legislature. Their constitutions accord so generally in both these circumstances, that they seem almost to have been preconcerted. This must either have been a miracle, or have resulted from the genius of the people." (*Elliot*, V, 216, 217.) Unquestionably the latter. "The bicameral system," writes Dr. Lieber, "accompanies the Anglican race like the common law." (*On Civil Liberty and Self-Government*, p. 197.)

This was and is the real foundation of the Senate: the conviction pure and simple—based not only upon the English precedent, but also upon their own experiences—that the bicameral system is preferable to the unicameral. To make the Senate besides a representation of Statehood was altogether an afterthought, gradually evolved by the necessity of a compromise between the large and the small States; and even then the Convention made it only the formative, but not also the really determinative principle, for it deliberately discarded its most obvious and most important logical consequence, the vote by States. According to Randolph's resolutions "the members of the second branch of the national Legislature" were "to be elected, by those of the first, out of a number of persons nominated by the individual Legislatures." In Pinckney's plan the Legislatures were not given any share in the formation of the Senate. It simply provided: "The Senate shall be elected and chosen by the House of Delegates."[1] But while—so far as we can learn from the extant sources—the thought of making the Senate a representation of the States as such was at first not entertained by a single member, several of the most prominent members strongly

[1] The members of the House of Delegates Pinckney wished to have elected by the Legislatures. (*Elliot*, V, 163, 164.) See Madison's explanation of the discrepancy between this opinion and Pinckney's "Plan" (*ibid.* V, 578, 579). R. Sherman advocated the same idea, avowedly because of his distrust of the people. "The people," he said, "immediately, should have as little to do as may be about the Government. They want information, and are constantly liable to be misled" (*ibid.* V, 136). Don't let us judge him too harshly for that. Jefferson, "the father of American democracy," wrote to Madison (Dec. 20, 1787): "I like the power given the Legislature to levy taxes, and for that reason solely (!), I approve of the greater House being chosen by the people directly. For though I think a House so chosen, will be very far inferior to the present Congress, will be very illy qualified to legislate for the Union, for foreign nations, etc., yet this evil does not weigh against the good, etc." (*Jefferson's Works*, II, 328.)

emphasised from the outset, (1) that, as Madison expressed it, the Convention ought to adopt "the policy of refining the popular appointments by successive filtrations" (*Elliot*, V, 137); (2) that, as Randolph said, "the number of the second branch ought to be much smaller than that of the first; so small as to be exempt from the passionate proceedings to which numerous assemblies are liable" (*ibid.* V, 138); (3) that the representation in the two branches ought to be put upon an essentially different basis. As to the latter point, the prevailing opinion evidently was that the Senate should be more especially "the representation of property." (*Ibid.* V, 166, 247, 260, I, 507.) Gerry expressed the hope that the election of senators by the Legislatures would tend "to provide some check in favor of the commercial interest against the landed; without which, oppression will take place." (*Ibid.* V, 168.)

In the course of the discussions some zealous advocates of only one chamber arose. Their arguments, however, so far from calling for some restricting qualifications of the statements made before in regard to this question, only serve as a further corroboration of them. Roger Sherman and Luther Martin admitted that the bicameral system is the only proper one for a State. They insisted upon one chamber for the Union solely because they were opposed to its being transformed into a State in the true sense of the word, but wanted it to remain what it was under the Articles of Confederation—a mere confederacy. (*Elliot*, V, 218; I, 359, 360.)

They reasoned correctly. If the Union was to remain a confederacy a Legislature of two branches was not only useless, but utterly inadmissible. Though the members of the legislature of a confederacy be legislators in name and form and according to the letter of the law, to the extent that the confederacy is really but a confederacy they can be virtually only ambassadors. Ambassadors however, are bound to voice the mind of another. Therefore it would be strictly a *non sense* for the principal to appoint two sets of ambassadors. To say that the unicameral system would have been a necessity if the Union was to remain a confederacy, is, however, not to say that its introduction now would reverse the evolutionary process and re-change the republic into a mere confederacy. No

other change in the legal character of the bond of union being intended, exactly the opposite would necessarily ensue, after we have been over a century legally a nation and actually become so ever more and more. Complete consolidation would be the inevitable consequence, and complete consolidation is incompatible with the maintenance of liberty. They are grossly mistaken who suppose that the abolition of the Senate would only amend the Constitution. It involves in the strict sense of the word a *radical* change of it, i. e. its total subversion. The day on which the radical visionaries triumph, who see in the Senate a gangrenous ulcer on the body politic, will be the beginning of the end of the Republic.

That this change of the Constitution would necessitate a number of other far-reaching changes is easily proved. What, for instance, is to become of impeachments? If they are not to be done away with, another tribunal for trying them would have to be instituted. The former course would hardly be deemed advisable, though many will agree with the late Justice Miller that impeachment "as an efficient remedy must be conceded to be a failure." The same eminent jurist was of opinion that it "has, perhaps, operated as a safety-valve in cases of great popular excitement," (*Lectures on the Constitution of the United States*, page 25,) and that is certainly worth something. Greater difficulties would present themselves in regard to a much more important function of the Senate. Should the Executive be wholly liberated from the control now exercised by the Senate in regard to the management of the international relations? This would surely not be advocated by many. To transfer this function simply to the House of Representatives, all of whose members are elected anew every second year, would however be still less advisable.[1] Though *The Federalist* is over a hundred years old, it can still be studied with considerable profit by the wisest of us. The day on which the reasonings of its authors on this head fail to carry conviction to the American people,

[1] "Foreign governments can never enter into any permanent arrangements with one whose councils and government are perpetually fluctuating. . . . Caprice is just as mischievous as folly, and corruption scarcely worse than perpetual indecision and fluctuation." (Story, *Commentaries*, § 717.)

would not deserve to be entered with red ink in their annals. These problems—and a considerable number could be readily added—suffice to show that the abolition of the Senate is too intricate a question to be satisfactorily disposed of in one column of a daily paper or even in twenty pages of a magazine. But though they are of no little consequence, they are after all only questions of detail, on which it is not necessary to dwell. If it can be proved that the abolition of the Senate would break down the very foundation of our whole political structure, nothing more is needed; and I think this can be proved.

In the Senate, says Pomeroy, "have we fast anchored in our fundamental law the principle of local self-government." (*An Introduction to the Constitutional Law of the United States*, page 121.) This principle is the vital force not only of Anglican, but also of Germanic liberty. Cease to guard and foster it, and the days of this liberty are as surely counted as a plant must wither and die, whose roots are cut off. Up to the days of the third republic, the French failed to realise that the prerequisite of liberty as to the State is local self-government. This was the main cause that, however heroic, their efforts to establish liberty were from the start doomed to be spasmodic and to run straight towards a disastrous reaction. The "liberty trees" they planted were no trees at all, but rootless poles.

But, it will be said, to treat Americans to these hackneyed truths is to carry owls to Athens. Though it must be admitted that in the Senate the principle of local self-government is anchored fast in our fundamental law, it is manifestly preposterous to assert that by the abolition of the Senate this principle would be swept from the American continent into the ocean. True enough. Only do not forget that the history of empires abounds with instances of forms allowed to remain intact and the spirit driven out of them as thoroughly as if they had never harbored so much as the shadow of any spirit. Rome still had its consuls and its senators when the Cæsar's horses could aspire to these dignities. And a federal legislature of only one chamber is certain to prove a besom of steel wire as to the sweeping out of the spirit of true local self-government.

Will it be asserted that this is idle croaking, because England, the mother country of this Republic, has practically but one legislative chamber, and local self-government as well as liberty are housed safely enough in the British Isles? I ask in reply, is there any analogy between those dots in the ocean and this continent, whose inhabitants, composed of nearly all the races of the earth, are sure to be counted by hundreds of millions within the lifetime of more than one baby of to-day? Besides, as to one most essential respect, it is not true that England has practically but one legislative chamber If the lords are good for nothing else, they render Great Britain the eminent service of having it in their power at any moment to compel the House of Commons and the English people to bethink themselves, to take time, to give "the sober second thought" a fair chance to assert itself. Read the debates of the federal convention and of the ratification conventions and *The Federalist*, and you will soon find out whether this was not one of the most essential functions, nay, pre-eminently *the* function assigned by the fathers of the Constitution to the Senate. Moreover, up to a recent date the character of the English government has been essentially aristocratic. How the old machinery of its so-called Constitution will work in the long run after thorough democratisation, is a question for the future to answer. Thus much, however, is revealed very clearly already, that things will not go on so smoothly as they have done heretofore. In many respects the value of the older political experiences of England as political lessons in the sense of precedents to be relied upon diminishes steadily and rapidly. As to the question in hand, there are other historical precedents available, which are more to the purpose and more instructive.

Is it an accident that, as Dr. Lieber says, "no one attempt at introducing the unicameral system, in larger countries, has so far succeeded? France, Spain, Naples, Portugal,—in all these countries it has been tried, and everywhere it has failed." (*On Civil Liberty and Self-Government*, page 197.) I admit that this is partly attributable to the peculiar character of these nations. But that they preferred the unicameral system is chiefly due to a particular trait of their character, and the unicameral system would, so to say, by

main force, inoculate this trait into the American character, and, though the American character is naturally strongly averse to it, the virus would in the nature of things work its way into the whole system and every year gain in potency.

"The idea of one house," says Dr. Lieber in the paragraph quoted before, "flows from that of the unity of power, so popular in France." Unity of power, however, is incompatible with liberty. Whether it be lodged in one, some, or all, makes no difference, or rather the larger the number with whom it rests, the greater the incompatibility, because the sense of personal moral responsibility is correspondingly blunted. To deny this incompatibility is to contend that there is no necessity for human nature to assert itself in human affairs. It is a gross fallacy that governmental powers, which are liable to abuse, ought not to be suffered, for the conception of society presupposes governmental powers and governmental powers not liable to abuse is a contradiction in terms. But it is a still grosser fallacy that unity of power is an irrefragable logical conclusion of the doctrine of popular sovereignty. Whoever says people, says organisation ; whoever says organisation, says complexity; whoever says complexity, says division of energy. Power is real power only to the extent that it can become active. The people are the source of all power, but they do not from choice only refrain from vitalising the power in such a manner that there is actually unity of power ; the nature of things renders it impossible. If it were possible, the doing it would be in itself the dissolution of society, for there would be no more organisation.

But however that be, the size of modern States has rendered democracies in the strict sense of the word impossible. Whether the people like representative government or not, they have no choice. But if this be so, what does the unity of power then signify, if not that the people deliberately set a master over themselves? "By no means," the radical visionary will reply ; "the representatives have of course to voice the will of their constituents." I ask : shall they be real representatives or merely phonographs? If the latter, Dahomey might be a more eligible country to live in than the United States. Besides, we are here again confronted by phys-

ical impossibilities. The people are able to make their will known to the extent of electing a Democrat, a Republican, or a Populist, and bidding them work for tariff reform or protection, for free coinage of silver or the gold standard, and so forth. But how about the details of which all legislation necessarily consists? As to these the will of the constituents cannot be ascertained. It is true, many newspaper-editors always know exactly what it is. The trouble, however, is that rarely any two of them agree.

"Granted as to the difficulty about the details," my imaginary opponent will say; "but that cannot be decisive, for at the next election the people will make known in no uncertain way, whether the representative has done what they wanted him to do." People who are perverse enough to think that in the elections they are frequently confined to a choice between evils will not derive from this as much consolation as our theorist. But apart from that. How about the mischief done in the mean time by the passing of laws calculated or even intended to render the Legislature the master of the people? The laws can be repealed, but the harm they have wrought, is done. An ounce of prevention is better than a pound of cure. This old English proverb contains the larger and better half of all true political wisdom.

"Ah, there I have you," I expect my friend to say. "Your democracy is of a very flimsy kind. You have no faith in the people. If the fountain be pure, the water in the river will run clear."

Yes, you have got me, but with me you have got the authors of the Constitution, the fathers of the country. In the sense you imply the fountain is not, never has been, nor ever will nor can be, pure; and you propose systematically and with ever increasing vigor to stir up all there is of sand and mud in it.

"It is an unquestionable truth," said Hamilton in the ratification convention of New York, "that the body of the people, in every country, desire sincerely its prosperity; but it is equally unquestionable, that they do not possess the discernment and stability necessary for systematic government. To deny that they are frequently led into the grossest errors by misinformation and passion,

would be a flattery which their own good sense must despise." (*Elliot*, II, 302.)

"Oh, Hamilton, the monarchist!" That would probably be all the answer vouchsafed to this quotation. Well, if the country had never had worse Republicans than Alexander Hamilton, its records would well bear inspection. But let us hear Madison, who was never suspected of being a monarchist. He said: "In order to judge of the form to be given to this institution (the Senate), it will be proper to take a view of the ends to be served by it. These were, first, to protect the people against their rulers; secondly, to protect the people against the transient impressions into which they themselves might be led." (*Elliot*, V, 242.)

Since when has it become a political heresy in this country that the people ought to protect themselves against their rulers? Or have we relapsed into the old puerile notion that only from the Executive any dangers are to be apprehended? "The Executive, in our governments," wrote Jefferson, March 15, 1789, to Madison, "is not the sole, it is scarcely the principal object of my jealousy. The tyranny of the Legislatures is the most formidable dread at present, and will be for many years." (*Jefferson's Works*, III, 5.) The most ruthless tyranny recorded in history was exercised in France by the Convention under the lead of the Terrorists. But nothing could be further from the truth than to suppose that the majority of the members of the Convention or even but a very considerable part of them were fiends. Because they were *men* they were driven by the terrible circumstances, partly bequeathed to them by the past and partly of their own creating, to act as if they were devils. *Men* also our representatives must of necessity be, and though individuals might successfully resist the current that would be created by our becoming converts to the doctrine of the unity of power, a numerous body of men could not do so for any length of time; though every single member were a Solon and Aristides combined, their joint weight would force them to drift with it, and drifting with it they would be compelled by their very weight to let themselves be carried along by it with ever increasing velocity. "To check the inherent bent of every government towards the dominant form im-

pressed upon it,"[1] Mirabeau declared to be one of the principal tasks of true statecraft, and the history of the French Revolution from its first to its last page is one continuous corroboration of this assertion written in letters of blood and living fire. Unchecked radical democracy, however, would be the dominant form impressed upon our government by the adoption of the unicameral system; and from the day of its adoption the history of the United States would, therefore, become a fearfully impressive sermon upon the text that "lead us not into temptation" is the prayer of prayers, of which legislative bodies and nations stand even infinitely more in daily need than individuals. The Legislature and the people would mutually push each other on in the mad race on the inclined plane. The Legislature could not check itself, though it were ever so willing and anxious to do so; the people would prevent its doing it. If the fathers of the country had reason to fear "the turbulence and follies of democracy" and "the mischievous influence of demagogues" (*Elliot*, V, 138), surely we have ampler reasons to beware of them and throw up ramparts against them. All over the Christian world the modern economical evolutions have ploughed the ground for them to the very bed-rock. The delusion of the omnipotence of legislation—the deadliest bane of liberty and all sound progress—is getting more and more rampant. Look at our Populists, at our Coxeyites, and you will be in no doubt as to whether we are exempt from the epidemic. Already hundreds of thousands of our citizens keep their hot eyes riveted upon Washington, the Mecca whence all blessings can come and must be made to come. Simplify legislation by entrusting it to one body, and the devout pilgrims will swarm to it—bodily or in the form of petitions, resolutions, platforms—like clouds of locusts. Remember, then, that already years ago the Grand Master of the Knights of Labor was invited kindly to favor Congress with his views on the best manner of solving the social problem, and that there were this year members of Congress advocating that the Coxeyites should be granted a deferential hearing, and go over the pages of the statute books—

[1] Méjan, *Collection complète des travaux de Mirabeau*, III, 366.

federal and State—and you will get no uncertain answer to the question, whether or no the pilgrims will know how to make themselves heard.

Nor could all the other provisions and checks of the Constitution afford us any adequate protection. If ever a political truth was proclaimed, Gouverneur Morris uttered it when he wrote to Timohty Pickering (December 22, 1814):

"But, after all, what does it signify that men should have a written constitution, containing unequivocal provisions and limitations? The legislative lion will not be entangled in the meshes of a logical net. The legislature will always make the power which it wishes to exercise, *unless it be so organised as to contain within itself the sufficient check. Attempts to restrain it from outrage, by other means, will only render it more outrageous.*" (*Elliot*, I, 507.)

The veto-power of the President would soon only render bad worse. It would be extinguishing a fire by screwing the hose of the engine to an oil-tank. Strife between the two powers would be the regular order of the day, as it was in the French Revolution, unless they pulled at the same rope, and then they would pull the republic only all the faster over the brink of the precipice. A "fatal conflict,"[1] or as fatal a co-operation, would soon be the only alternative.

"Tripartite division in the power of legislation—so at the time wrote Madison, so thought all the great builders of the Constitution, so asserted John Adams with vehemence and sound reasoning—is absolutely essential to the success of a federal republic; for if all the legislative powers are vested in one man or in one assembly, there is despotism; if in two branches, there is a restless antagonism between the two; if they are distributed among three, it will be hard to unite two of them in a fatal strife with the third." (*Bancroft*, II, 328.)

He who demurs to this statement of Bancroft reads the history of the United States with eyes that would blot the sun from the skies, because it has spots.

The political physicians, who propose to deliver us from our ailings by the abolition of the Senate, imitate Dr. Eisenbart, of the German student's song, curing toothache most effectively forever and a day by cutting the patient's head off. And their methods bear even a much closer resemblance to those of their famous prototype.

---

[1] Bancroft, *History of the Formation of the Constitution*, II, 16.

He made the blind walk again, and restored the eyesight to the lame. That is exactly what they propose to do, and it is mainly for this reason that a serious discussion of the question is imperatively called for, though it is an absolute certainty that for many a year to come their recommendations will not be acted upon.

It is not the first time that the Senate has been complained of. Even the very charge, which is now for nearly a year running every day through the press, was brought against it exactly a century ago by Jefferson. "The failure of the Non-importation Bill" in the Senate caused him to write on May 15, 1794, to Madison:

"This body was intended as a check on the will of the Representatives when too hasty. They are not only that, but completely so on the will of the people also. . . . It seems that the opinion is fairly launched into public that they should be placed under the control of a more frequent recurrence to the will of their constituents This seems to be requisite to complete the experiment, whether they do more harm or good." (*Jefferson's Works*, IV, 107.)

Whether anger did not make him see more than there was, and whether the Senate had in this case acted unwisely, need not here be examined. That many of the exceptions taken to its course in later years were not without foundation, will not be denied. In spite of that, however, three generations have been practically unanimous in thinking that, taking all in all, Judge Story was right when he wrote:

"It has not only been demonstrated (by experience) that the Senate, in its actual organisation, is well adapted to the exigencies of the nation, but that it is a most important and valuable part of the system, and the real balance-wheel which adjusts and regulates its movements." (*Commentaries*, § 702.)

Unless three generations have been egregiously incompetent to form an intelligent opinion of their own interests, it has, therefore, been irrefutably proved that, upon the whole, the *institution* was well devised. In other words: the evils we complain of cannot be justly chargeable to the *institution*, and, consequently, they cannot be cured by abolishing the *institution*. There is no more sense in holding the fathers of the Constitution responsible for it that the Senate has of late been deteriorating to an alarming degree, than there is in bringing a suit against a physician for the sickness brought about by

combining the treatment prescribed by him with the deleterious potions of half a dozen ignorant and unscrupulous quacks. The decline of the Senate is undoubtedly the cause of most serious evils, but this decline is itself a symptom and the result of causes lying outside of and deeper than the Constitution.

"No amount of wisdom in a Constitution," says Justice Miller, "can produce wise government, unless there is a suitable response in the spirit of the people." (*Lectures on the Constitution*, p. 32.) And Story writes: "Private and public virtue is the foundation of republics; and it is folly, if it is not madness, to expect that rulers will not buy what the people are eager to sell. The people may guard themselves against the oppressions of their governors; but who shall guard them against their own oppression of themselves." (*Commentaries*, § 719.)

Let these wise and profound truisms be pondered well by those who think they can lift the Senate again to its former intellectual and moral level by transferring the election of senators from the Legislatures to the people. I do not mean to express myself adversely to this change. But while I admit that it may tend to mend matters somewhat, I am very sure that it cannot effect a real cure of the evil. The advocates of this change are not liable to a grave charge that has to be brought against the radicals, whose virtuous indignation over the shortcomings of the Senate pushes them to the extreme of preaching, that there is no cure,—that the people will have to bear the evil and grin, if they either cannot or will not consign the Senate to the things of the past. The latter are betrayed by their ill-advised patriotic ardor into spending the strength, which might and ought to be devoted to breaking the ground for genuine reforms, in attempts to switch off public opinion on to a track leading strāight on to disaster. The former are exerting themselves in behalf of what may unquestionably turn out to be a reform. Still there is at least great danger that they too will mislead public opinion by—wittingly or unwittingly—making it believe that what can at best be a reform, will be a cure. If they do that, they will have wrought more harm than good, for what is needed first and above

all is the opening of the eyes of the people to the true nature and the real causes of the evil.

To contend in the face of the Senate's record for three generations that the election of senators by the State Legislatures had necessarily to prove a failure, is manifestly absurd. If the Legislatures have of late so frequently failed to elect men of the proper stamp that the general character of the Senate has thereby been seriously lowered, the Legislatures must evidently have deteriorated. That a spreading and progressing deterioration of the State Legislatures must affect the nation's life as injuriously as the deterioration of the federal Senate, is, however, self-evident, though Judge Story is unquestionably right in saying: "There is probably no legislative body on earth whose duties are more various and interesting and important to the public welfare, and none which calls for higher talents and more comprehensive attainments and more untiring industry and integrity." (*Commentaries*, § 707.) And as the people can elect to the State Legislatures whomsoever they see fit, it is as incontestable that the people are at fault, if there be a spreading and progressing deterioration of the State Legislatures. Therefore to scold the Senate for being, intellectually and morally, so much below its task, and the State Legislatures for not electing the proper sort of men, is but to denounce the symptoms of the disease. No disease has ever been cured by doing that, and this must be aggravated by it, for it averts the people's attention from the true causes and unless these are fought unremittingly and energetically, they *must* go on gaining steadily and rapidly in potency. It is not only impossible to stamp out the disease, but it must eat its way ever deeper into the very vitals of the republic, so long as the people are lacking either the discernment or the moral courage to lay the blame where it really belongs—at their own door.

To say that the responsibility ultimately rests with the people is, however, to say also that in the nature of things there can be no specific remedy. Specific measures cannot only be helpful, but they are absolutely indispensable. In politics the faith-cure system never works. Though private and public virtue is undoubtedly the foundation of republics, the mere preaching of the necessity of private

and public virtue is not only unavailing, but very apt to work as a benumbing opiate. Definite measures are needed to bar the way to evil tendencies and noxious influences, to stimulate the activity of the vital energies, and to fight the symptoms, which become themselves causes of derangement if they be left unchecked. But if the disease is of long standing and complicated, and if it has affected the whole system, only the veriest quack can believe for a moment that all that is required is to apply some nostrum. Nothing but the removal of all the causes will do and that requires time, patient and persistent work, much deliberation and even experimenting, and a great deal of moral courage and self-abnegation. To keep a great democratic republic hale and sound or to restore it to health if it be diseased, is not so simple and easy as many people—to judge from their talking and still more from their acting—seem to think. It cannot be done either by shouting "hip, hip, hurrah!" or by looking contemptuously and pityingly at "effete monarchies" and praying: "We thank Thee, God, that we are not like these publicans." It is the most arduous task any nation can be put to and it must grow every day more arduous and more difficult, if the problem is not satisfactorily solved every day. In a democratic republic less than under any other form of government is there such a thing as a standstill; onward and upward, or backward and downward—there is no other possibility. The fathers of the country and the authors of the Constitution have bequeathed us not only a splendid heritage, but also an awful trust and a fearful responsibility. Let us beware lest we shall stand branded, as they stand exalted in the annals of mankind.

Let us not turn pessimists—we have no reason to. But let us not be optimists either, wafting on in a self-complacent *dolce far niente*; they are an even more harmful set than the lugubrious croakers. Let us be, what we ought to be—true patriots, looking the facts square in the face in order to do—each of us—our fair share in honestly, vigorously, and hopefully fighting the deeper causes, of which the eclipse of the Senate is but one effect—the evils, with which it stands not only in close, but in organic and genetic connexion.

UNIVERSITY OF CHICAGO. H. VON HOLST.

ON THE PRINCIPLE OF THE CONSERVATION OF ENERGY.[1]

IN a popular lecture, distinguished for its charming simplicity and clearness, which Joule delivered in the year 1847,[2] that famous physicist declares that the living force which a heavy body has acquired by its descent through a certain height and which it carries with it in the form of the velocity with which it is impressed, is the *equivalent* of the attraction of gravity through the space fallen through, and that it would be "absurd" to assume that this living force could be destroyed without some restitution of that equivalent. He then adds: "You will therefore be surprised to hear that until very *recently* the universal opinion has been that living force could be absolutely and irrevocably destroyed at any one's option." Let us add that to-day, after forty-seven years, the *law of the conservation of energy*, wherever civilisation reaches, is accepted as a fully established truth and receives the widest applications in all domains of natural science.

The fate of all momentous discoveries is similar. On their first appearance they are regarded by the majority of men as errors. J. R. Mayer's work on the principle of energy (1842) was rejected by the first physical journal of Germany; Helmholtz's treatise (1847) met with no better success; and even Joule, to judge from an intimation of Playfair, seems to have encountered difficulties with his

[1] Translated from Professor Mach's manuscript by Thomas J. McCormack.

[2] *On Matter, Living Force, and Heat*, Joule: *Scientific Papers*, London, 1884 I, p. 265.

first publication (1843). Gradually, however, people are led to see that the new view was long prepared for and ready for enunciation, only that a few favored minds had perceived it much earlier than the rest, and in this way the opposition of the majority is overcome. With proofs of the fruitfulness of the new view, with its success, confidence in it increases. The majority of the men who employ it cannot enter into a deep-going analysis of it; for them, its success is its proof. It can thus happen that a view which has led to the greatest discoveries, like Black's theory of caloric, in a subsequent period in a province where it does not apply may actually become an obstacle to progress by its blinding our eyes to facts which do not fit in with our favorite conceptions. If a theory is to be protected from this dubious rôle, the grounds and motives of its evolution and existence must be examined from time to time with the greatest care.

The most multifarious physical changes, thermal, electrical, chemical, and so forth, may be brought about by mechanical work. When such alterations are reversed they yield anew the mechanical work in exactly the quantity which was required for the production of the part reversed. This is the *principle of the conservation of energy*; "energy" being the term which has gradually come into use for that "indestructible something" of which the measure is mechanical *work*.

How did we acquire this idea? What are the sources from which we have drawn it? This question is not only of interest in itself, but also for the important reason above touched upon. The opinions which are held concerning the foundations of the law of energy still diverge very widely from one another. Many trace the principle to the impossibility of a perpetual motion, which they regard either as sufficiently proved by experience, or as self-evident. In the province of pure mechanics the impossibility of a perpetual motion, or the continuous production of *work* without some *permanent* alteration, is easily demonstrated. Accordingly, if we start from the theory that all physical processes are purely *mechanical* processes, motions of molecules and atoms, we embrace also, by this *mechanical* conception of physics, the impossibility of a perpetual motion in the

whole physical domain. At present this view probably counts the most adherents. Other inquirers, however, are for accepting only a purely *experimental* establishment of the law of energy.

It will appear, from the discussion to follow, that *all* the factors mentioned have co-operated in the development of the view in question; but that in addition to them a logical and purely formal factor, hitherto little considered, has also played a very important part.

I. THE PRINCIPLE OF THE EXCLUDED PERPETUAL MOTION.

The law of energy in its modern form is not identical with the principle of the excluded perpetual motion, but it is very closely related to it. The latter principle, however, is by no means new, for in the province of mechanics it has controlled for centuries the thoughts and investigations of the greatest thinkers. Let us convince ourselves of this by the study of a few historical examples.

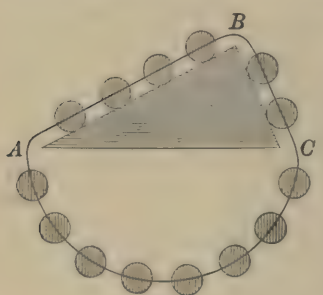

Fig. 1.

S. Stevinus, in his famous work *Hypomnemata mathematica*, Tom. IV, *De statica*, (Leyden, 1605, p. 34), treats of the equilibrium of bodies on inclined planes.

Over a triangular prism *A B C*, one side of which, *A B*, is horizontal, an endless cord or chain is slung, to which at equal distances apart fourteen balls of equal weight are attached, as represented in cross-section in Figure 1. Since we can imagine the lower symmetrical part of the cord *A B C* taken away, Stevinus concludes that the four balls on *A B* hold in equilibrium the two balls on *B C*. For if the equilibrium were for a moment disturbed, it could never subsist: the cord would keep moving round forever in the same direction,—we should have a perpetual motion. He says:

"But if this took place, our row or ring of balls would come once more into their original position, and from the same cause the eight globes to the left would again be heavier than the six to the right, and therefore those eight would sink a second time

and these six rise, and all the globes would keep up, of themselves, *a continuous and unending motion, which is false.*"[1]

Stevinus, now, easily derives from this principle the laws governing equilibrium on the inclined plane and numerous other fruitful consequences.

In the chapter "Hydrostatics" of the same work, page 114, Stevinus sets up the following principle: "Aquam datam, datum sibi intra aquam locum servare,"—a given mass of water preserves within water its given place. This principle is demonstrated as follows (see Fig. 2):

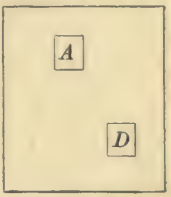

Fig. 2.

"For, assuming it to be possible by natural means, let us suppose that *A* does not preserve the place assigned to it, but sinks down to *D*. This being posited, the water which succeeds *A* will, for the same reason, also flow down to *D*; *A* will be forced out of its place in *D*; and thus this body of water, for the conditions in it are everywhere the same, *will set up a perpetual motion, which is absurd.*"[2]

From this all the principles of hydrostatics are deduced. On this occasion Stevinus also first develops the thought so fruitful for modern analytical mechanics that the equilibrium of a system is not destroyed by the addition of rigid connexions. As we know, the principle of the conservation of the centre of gravity is now sometimes deduced from D'Alembert's principle with the help of that remark. If we were to reproduce Stevinus's demonstration to-day, we should have to change it slightly. We find no difficulty in imagining the cord on the prism possessed of unending uniform motion if all hindrances are thought away, but we should protest against the assumption of an accelerated motion or even against that of a uniform motion, if the resistances were not removed. Moreover, for greater precision of proof, the string of balls might be replaced

[1] "Atqui hoc si sit, globorum series sive corona eundem situm cum priore habebit, eademque de causa octo globi sinistri ponderosiores erunt sex dextris, ideoque rursus octo illi descendent, sex illi ascendent, istique globi ex sese *continuum et aeternum motum efficient, quod est falsum.*"

[2] "*A* igitur, (si ullo modo per naturam fieri possit) locum sibi tributum non servato, ac delabatur in *D*; quibus positis aqua quae ipsi *A* succedi teandem ob causam deffluet in *D*, eademque ab alia istinc expelletur, atque adeo aqua haec (cum ubique eadem ratio sit) *motum instituet perpetuum, quod absurdum fuerit.*"

by a heavy homogeneous cord of infinite flexibility. But all this does not affect in the least the historical value of Stevinus's thoughts. It is a fact, Stevinus deduces apparently much simpler truths from the principle of an impossible perpetual motion.

In the process of thought which conducted Galileo to his discoveries at the end of the sixteenth century, the following principle plays an important part, that a body in virtue of the velocity acquired in its descent can rise exactly as high as it fell. This principle, which appears frequently and with much clearness in Galileo's thought, is simply another form of the principle of excluded perpetual motion, as we shall see it is also in Huygens.

Galileo, as we know, arrived at the law of uniformly accelerated motion by *a priori* considerations, as that law which was the "simplest and most natural," after having first assumed a different law which he was compelled to reject. To verify his law he executed experiments with falling bodies on inclined planes, measuring the times of descent by the weights of the water which flowed out of a small orifice in a large vessel. In this experiment he assumes as a fundamental principle, that the velocity acquired in descent down an inclined plane always corresponds to the vertical height descended through, a conclusion which for him is the immediate outcome of the fact that a body which has fallen down one inclined plane can, with the velocity it has acquired, rise on another plane of any inclination only to the same vertical height. This principle of the height of ascent also led him, as it seems, to the law of inertia. Let us hear his own masterful words in the *Dialogo terzo* (*Opere* Padova, 1744, Tom. III). On page 96 we read:

"I take it for granted that the velocities acquired by a body in descent down planes of different inclinations are equal if the heights of those planes are equal."[1]

Then he makes Salviati say in the dialogue:[2]

"What you say seems very probable, but I wish to go further and by an experiment so to increase the probability of it that it shall amount almost to absolute demon-

[1] "Accipio, gradus velocitatis ejusdem mobilis super diversas planorum inclinationes acquisitos tunc esse aequales, cum eorundem planorum elevationes aequales sint."

[2] "Voi molto probabilmente discorrete, ma oltre al veri simile voglio con una

stration. Suppose this sheet of paper to be a vertical wall, and from a nail driven in it a ball of lead weighing two or three ounces to hang by a very fine thread AB four or five feet long. (Fig. 3.) On the wall mark a horizontal line DC perpendicular to the vertical AB, which latter ought to hang about two inches from the wall. If now the thread AB with the ball attached take the position AC and the ball be let go, you will see the ball first descend through the arc CBD and passing beyond B rise through the arc BD almost to the level of the line CD, being prevented from reaching it exactly by the resistance of the air and of the thread. From this we may truly conclude that its impetus at the point B, acquired by

---

esperienza crescer tanto la probabilità, che poco gli manchi all'agguagliarsi ad una ben necessaria dimostrazione. Figuratevi questo foglio essere una parete eretta al orizzonte, e da un chiodo fitto in essa pendere una palla di piombo d'un'oncia, o due, sospesa dal sottil filo $A\,B$ lungo due, o tre braccia perpendicolare all' orrizonte, e nella parete segnate una linea orrizontale $D\,C$ segante a squadra il perpendicolo $A\,B$, il quale sia lontano dalla parete due dita in circa, trasferendo poi il filo $A\,B$ colla palla in $A\,C$, lasciata essa palla in libertà, la quale primier amente vedrete scendere descrivendo l'arco $C\,B\,D$, e di tanto trapassare il termine B, che scorrendo per l'arco $B\,D$ sormonterà fino quasi alla segnata parallela $C\,D$, restando di per vernirvi per piccolissimo intervallo, toltogli il precisamente arrivarvi dall' impedimento dell'aria, e del filo. Dal che possiamo veracemente concludere, che l'impeto acquistato nel punto B dalla palla nello scendere per l'arco $C\,B$, fu tanto, che bastò a risospingersi per un simile arco $B\,D$ alla medesima altezza ; fatta, e più volte reiterata cotale esperienza, voglio, che fiechiamo nella parete rasente al perpendicolo $A\,B$ un chiodo come in E, ovvero in F, che sporga in fuori cinque, o sei dita, e questo acciocchè il filo $A\,C$ tornando come prima a riportar la palla C per l'arco $C\,B$, giunta che ella sia in B, inoppando il filo nel chiodo E, sia costretta a camminare per la circonferenza $B\,G$ descritta in torno al centro E, dal che vedremo quello, che potrà far quel medesimo impeto, che dianzi concepizo nel medesimo termine B, sospinse l'istesso mobile per l'arco $E\,D$ all'altezza dell'orizzonale $C\,D$. Ora, Signori, voi vedrete con gusto condursi la palla all'orizzontale nel punto G, e l'istesso accadere, l'intoppo si metesse più basso, come in F, dove la palla descriverebbe l'arco $B\,J$, terminando sempre la sua salita precisamente nella linea $C\,D$, e quando l'intoppe del chiodo fusse tanto basso, che l'avanzo del filo sotto di lui non arivasse all' altezza di $C\,D$ (il che accaderebbe, quando fusse più vicino al punto B, che al segamento dell' $A\,B$ coll'orizzontale $C\,D$), allora il filo cavalcherebbe il chiodo, e segli avolgerebbe intorno. Questa esperienza non lascia luogo di dubitare della verità del supposto : imperocchè essendo li due archi $C\,B$, $D\,B$ equali e similmento posti, l'acquisto di momento fatto per la scesa nell'arco $C\,B$, è il medesimo, che il fatto per la scesa dell'arco $D\,B$; ma il momento acquistato in B per l'arco $C\,B$ è potente a risospingere in su il medesimo mobile per l'arco $B\,D$; adunque anco il momento acquistato nella scesa $D\,B$ è eguale a quello, che sospigne l'istesso mobile pel medesimo arco da B in D, sicche universalmente ogni momento acquistato per la scesa dun arco è eguale a quello, che può far risalire l'istesso mobile pel medesimo arco : ma i momenti tutti che fanno risalire per tutti gli archi $B\,D$, $B\,G$, $B\,J$ sono eguali, poichè son fatti dal istesso medesimo momento acquistato per la scesa $C\,B$, come mostra l'esperienza : adunque tutti i momenti, che si acquistano per le scese negli archi $D\,B$, $G\,B$, $J\,B$ sono eguali."

its descent through the arc CB, is sufficient to urge it through a similar arc BD to the same height. Having performed this experiment and repeated it several times, let us drive in the wall, in the projection of the vertical AB, as at E or at F, a nail five or six inches long, so that the thread AC, carrying as before the ball through the arc CB, at the moment it reaches the position AB, shall strike the nail E, and the ball be thus compelled to move up the arc BG described about E as centre. Then we shall see what the same impetus will here accomplish, acquired now as before at the same point B, which then drove the same moving body through the arc BD to the height of the horizontal CD. Now gentlemen, you will be pleased to see the ball rise to the horizontal line at the point G, and the same thing also happen if the nail be placed lower as at F, in which case the ball would describe the arc BJ, always terminating its ascent precisely at the line CD. If the nail be placed so low that the length of thread below it does not reach the height of CD (which would happen if F were nearer B than to the intersection of AB with the horizontal CD), then the thread will wind itself about the nail. This experiment leaves no room for doubt as to the truth of the supposition. For as the two arcs CB, DB are equal and similarly situated, the momentum acquired in the descent of the arc CB is the same as that acquired in the descent of the arc DB; but the momentum acquired at B by the descent through the arc CB is capable of driving up the same moving body through the arc BD; hence also the momentum acquired in the descent DB is equal to that which drives the same moving body through the same arc from B to D, so that in general every momentum acquired in the descent of an arc is equal to that which causes the same moving body to ascend through the same arc; but all the momenta which cause the ascent of all the arcs BD, BG, BJ, are equal since they are made by the same momentum acquired in the descent CB, as the experiment shows: therefore all the momenta acquired in the descent of the arcs DB, GB, JB are equal."

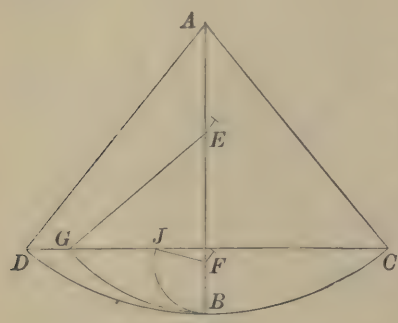

Fig. 3.

The remark relative to the pendulum may be applied to the inclined plane and leads to the law of inertia. We read on page 124:[1]

"It is plain now that a movable body, starting from rest at A and descending down the inclined plane AB, acquires a velocity proportional to the increment of

[1] "Constat jam, quod mobile ex quiete in A descendens per AB, gradus acquirit velocitatis juxta temporis ipsius incrementum: gradum vero in B esse maximum acquisitorum, et suapte natura immutabiliter impressum, sublatis scilicet causis

its time: the velocity possessed at B is the greatest of the velocities acquired, and by its nature immutably impressed, provided all causes of new acceleration or retardation are taken away: I say acceleration, having in view its possible further progress along the plane extended; retardation, in view of the possibility of its being reversed and made to mount the ascending plane $B\,C$. But in the horizontal plane $G\,H$ its equable motion, according to its velocity as acquired in the descent from A to B, will be continued *ad infinitum*."

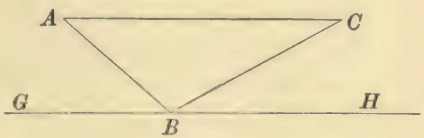

Fig. 4.

Huygens, in every respect the lineal successor of Galileo, forms a sharper conception of the law of inertia and generalises the principle respecting the heights of ascent which was so fruitful in Galileo's hands. He employs the latter principle in the solution of the problem of the centre of oscillation and is perfectly clear in the statement that the principle respecting the heights of ascent is identical with the principle of the excluded perpetual motion.

The following important passages then occur, (Hugenii, *Horologium oscillatorium, pars secunda*). *Hypotheses*:

"If gravity did not exist, nor the atmosphere obstruct the motions of bodies, a body would keep up forever the motion once impressed upon it, with equable velocity, in a straight line."[1]

In part fourth of the *Horologium de centro oscillationis* we read:

"If any number of weights be set in motion by the force of their gravity, the common centre of gravity of the weights as a whole cannot possibly rise higher than the place which it occupied when the motion began.

"That this hypothesis of ours may arouse no scruples, we will state that it simply imports, what no one has ever denied, that heavy bodies do not move *upwards*.—And truly if the devisers of the new machines who make such futile attempts to construct a perpetual motion would acquaint themselves with this princi-

accelerationis novae, aut retardationis: accelerationis inquam, si adhuc super extenso plano ulterius progrederetur; retardationis vero, dum super planum acclive $B\,C$ fit reflexio: in horizontali autem $G\,H$ aequabilis motus juxta gradum velocitatis ex A in B acquisitae in infinitum extenderetur.

[1] "Si gravitas non esset, neque aër motui corporum officeret, unumquodque eorum, acceptum semel motum continuaturum velocitate aequabili, secundum lineam rectam."

ple, they could easily be brought to see their errors and to understand that the thing is utterly impossible by mechanical means."[1]

There is possibly a Jesuitical mental reservation contained in the words "mechanical means." One might be led to believe from them that Huygens held a non-mechanical perpetual motion for possible.

The generalisation of Galileo's principle is still more clearly put in Proposition IV of the same chapter:

"If a pendulum, composed of several weights, set in motion from rest, complete any part of its full oscillation, and from that point onwards, the individual weights, with their common connexions dissolved, change their acquired velocities upwards and ascend as far as they can, the common centre of gravity of all will be carried up to the same altitude that it occupied before the beginning of the oscillation."[2]

On this last principle now, which is a generalisation, applied to a system of masses, of one of Galileo's ideas respecting a single mass and which from Huygens's explanation we recognise as the principle of excluded perpetual motion, Huygens grounds his theory of the centre of oscillation. Lagrange characterises this principle as precarious and is rejoiced at James Bernoulli's successful attempt, in 1681, to reduce the theory of the centre of oscillation to the laws of the lever, which appeared to him clearer. All the great inquirers of the seventeenth and eighteenth centuries broke a lance on this problem and it led ultimately, in conjunction with the principle of virtual velocities, to the principle enunciated by D'Alembert in 1743

[1] "Si pondera quotlibet, vi gravitatis suae, moveri incipiant; non posse centrum gravitatis ex ipsis compositae altius, quam ubi incipiente motu reperiebatur, ascendere.

"Ipsa vero hypothesis nostra quominus scrupulum moveat, nihil aliud sibi velle ostendemus, quam, quod nemo unquam negavit, gravia nempe sursum non ferri.—Et sane, si hac eadem uti scirent novorum operum machinatores, qui motum perpetuum irrito conatu moliuntur, facile suos ipsi errores deprehenderent, intelligerentque rem eam mechanica ratione haud quaquam possibilem esse."

[2] "Si pendulum e pluribus ponderibus compositum, atque e quiete dimissum, partem quamcunque oscillationis integrae confecerit, atque inde porro intelligantur pondera ejus singula, relicto communi vinculo, celeritates acquisitas sursum convertere, ac quousque possunt ascendere; hoc facto centrum gravitatis ex omnibus compositae, ad eandem altitudinem reversum erit, quam ante inceptam oscillationem obtinebat."

in his *Traité de dynamique*, though previously employed in a somewhat different form by Euler and Hermann.

Besides this, the Huygenian principle respecting the heights of ascent became the foundation of the "law of the conservation of living force," as it was enunciated by John and Daniel Bernoulli and employed with such signal success by the latter in his *Hydrodynamics*. The theorems of the Bernoullis differ only in form from Lagrange's expression in the *Analytical Mechanics*.

The manner in which Torricelli reached his famous law of efflux for liquids leads again to our principle. Torricelli assumed that the liquid which flows out of the basal orifice of a vessel cannot by its velocity of efflux ascend to a greater height than its level in the vessel.

Let us next consider a point which belongs to pure mechanics, the history of the principle of *virtual motions* or *virtual velocities*. This principle was not first enunciated, as is usually stated, and as Lagrange also asserts, by Galileo, but earlier, by Stevinus. In his *Trochleostatica* of the above-cited work, page 72, he says:

"Observe that this axiom of statics holds good here:

"As the space of the body acting is to the space of the body acted upon, so is the power of the body acted upon to the power of the body acting."[1]

Galileo, as we know, recognised the truth of the principle in the consideration of the simple machines, and also deduced the laws of the equilibrium of liquids from it.

Torricelli carries the principle back to the properties of the centre of gravity. The condition controlling equilibrium in a simple machine, in which power and load are represented by weights, is that the common centre of gravity of the weights shall not sink. Conversely, if the centre of gravity cannot sink equilibrium obtains, because heavy bodies of themselves do not move upwards. In this form the principle of virtual velocities is identical with Huygens's principle of the impossibility of a perpetual motion.

John Bernoulli, in 1717, first perceived the general significance

---

[1] "Notato autem hic illud staticum axioma etiam locum habere:
"Ut spatium agentis ad spatium patientis
Sic potentia patientis ad potentiam agentis."

of the principle of virtual movements for all systems; a discovery stated in a letter to Varignon. Finally, Lagrange gives a general demonstration of the principle and founds upon it his whole *Analytical Mechanics*. But this general demonstration is based after all upon Huygens and Torricelli's remarks. Lagrange, as is known, conceives simple pulleys arranged in the directions of the forces of the system, passes a cord through these pulleys, and appends to its free extremity a weight which is a common measure of all the forces of the system. With no difficulty, now, the number of elements of each pulley may be so chosen that the forces in question shall be replaced by them. It is then clear that if the weight at the extremity cannot sink, equilibrium subsists, because heavy bodies cannot of themselves move upwards. If we do not go so far, but wish to abide by Torricelli's idea, we may conceive every individual force of the system replaced by a special weight suspended from a cord passing over a pulley in the direction of the force and attached at its point of application. Equilibrium subsists then when the common centre of gravity of all the weights together cannot sink. The fundamental supposition of this demonstration is plainly the impossibility of a perpetual motion.

Lagrange tried in every way to supply a proof free from extraneous elements and fully satisfactory, but without complete success. Nor were his successors more fortunate.

The whole of mechanics, thus, is based upon an idea which, though unequivocal, is yet unwonted and not coequal with the other principles and axioms of mechanics. Every student of mechanics, at some stage of his progress, feels the uncomfortableness of this state of affairs; every one wishes it removed; but seldom is the difficulty stated in words. Accordingly, the zealous pupil of the science is highly rejoiced when he reads in a master like Poinsot (*Théorie générale de l'équilibre et du mouvement des systèmes*) the following passage, in which that author is giving his opinion of the *Analytical Mechanics*:

"In the meantime, because our attention in that work was first wholly engrossed with the consideration of its beautiful development of mechanics, which seemed to spring complete from a single formula, we naturally believed that the science was

completed or that it only remained to seek the demonstration of the principle of virtual velocities. But that quest brought back all the difficulties that we had overcome by the principle itself. That law so general, wherein are mingled the vague and unfamiliar ideas of infinitely small movements and of perturbations of equilibrium, only grew obscure upon examination; and the work of Lagrange supplying nothing clearer than the march of analysis, we saw plainly that the clouds had only appeared lifted from the course of mechanics because they had, so to speak, been gathered at the very origin of that science.

"At bottom, a general demonstration of the principle of virtual velocities would be equivalent to the establishment of the whole of mechanics upon a different basis: for the demonstration of a law which embraces a whole science is neither more nor less than the reduction of that science to another law just as general, but evident, or at least more simple than the first, and which, consequently, would render that useless."[1]

According to Poinsot, therefore, a proof of the principle of virtual movements is tantamount to a total rehabilitation of mechanics.

Another circumstance of discomfort to the mathematician is, that in the historical form in which mechanics at present exists, dynamics is founded on statics, whereas it is desirable that in a science which pretends to deductive completeness the more special statical theorems should be deducible from the more general dynamical principles.

In fact, a great master, Gauss, gave expression to this desire in his presentment of the principle of least constraint (Crelle's *Journal für reine und angewandte Mathematik*, Vol. IV, p. 233) in the follow-

[1] "Cependant, comme dans cet ouvrage on ne fut d'abord attentif qu'à considérer ce beau développement de la mécanique qui semblait sortir tout entière d'une seule et même formule, on crut naturellement que la science etait faite, et qu'il ne restait plus qu'à chercher la démonstration du principe des vitesses virtuelles. Mais cette recherche ramena toutes les difficultés qu'on avait franchies par le principe même. Cette loi si générale, où se mêlent des idées vagues et étrangères de mouvements infinement petits et de perturbation d'équilibre, ne fit en quelque sorte que s'obsurcir à l'examen; et le livre de Lagrange n'offrant plus alors rien de clair que la marche des calculs, on vit bien que les nuages n'avaient paru levé sur le cours de la mécanique que parcequ'ils étaient, pour ainsi dire, rassemblés à l'origine même de cette science.

"Une démonstration générale du principe des vitesses virtuelles devait au fond revenir a établir le mécanique entière sur une autre base: car la demonstration d'une loi qui embrasse toute une science ne peut être autre chose que la reduction de cette science à une autre loi aussi générale, mais évidente, ou du moins plus simple que la première, et qui partant la rende inutile."

ing words: "Proper as it is that in the gradual development of a science, and in the instruction of individuals, the easy should precede the difficult, the simple the complex, the special the general, yet the mind, when once it has reached a higher point of view, demands the contrary course, in which all statics shall appear simply as a special case of mechanics." Gauss's own principle, now, possesses all the requisites of universality, but its difficulty is that it is not immediately intelligible and that Gauss deduced it with the help of D'Alembert's principle, a procedure which left matters where they were before.

Whence, now, is derived this strange part which the principle of virtual motion plays in mechanics? For the present I shall only make this reply. It would be difficult for me to tell the difference of impression which Lagrange's proof of the principle made on me when I first took it up as a student and when I subsequently resumed it after having made historical researches. It first appeared to me insipid, chiefly on account of the pulleys and the cords which did not fit in with the mathematical view, and whose action I would much rather have discovered from the principle itself than have taken for granted. But now that I have studied the history of the science I cannot imagine a more beautiful demonstration.

In fact, through all mechanics it is this self-same principle of excluded perpetual motion which accomplishes almost all, which displeased Lagrange, but which he had yet to employ, at least tacitly, in his own demonstration. If we give this principle its proper place and setting, the paradox is explained.

The principle of excluded perpetual motion is thus no new discovery; it has been the guiding idea, for three hundred years, of all the great inquirers. But the principle cannot properly be *based* upon mechanical perceptions. For long before the development of mechanics the conviction of its truth existed and even contributed to that development. Its power of conviction, therefore, must have more universal and deeper roots. We shall revert to this point.

II. MECHANICAL PHYSICS.

It cannot be denied, that an unmistakable tendency has prevailed, from Democritus to the present day, to explain *all* physical events *mechanically*. Not to mention earlier obscure expressions of that tendency we read in Huygens the following : [1]

"There can be no doubt that light consists of the *motion* of a certain substance. For if we examine its production, we find that here on earth it is principally fire and flame which engender it, both of which contain beyond doubt bodies which are in rapid movement, since they dissolve and destroy many other bodies more solid than they : while if we regard its effects, we see that when light is accumulated, say by concave mirrors, it has the property of combustion just as fire has, that is to say, it disunites the parts of bodies, which is assuredly a proof of *motion*, at least in the *true philosophy*, in which the causes of all natural effects are conceived as *mechanical* causes. Which in my judgment must be accomplished or all hope of ever understanding physics renounced." [2]

S. Carnot,[3] in introducing the principle of excluded perpetual motion into the theory of heat, makes the following apology :

"It will be objected here, perhaps, that a perpetual motion proved impossible for *purely mechanical actions*, is perhaps not so when the influence of *heat* or of electricity is employed. But can phenomena of heat or electricity be thought of as due to anything else than to *certain motions of bodies*, and as such must they not be subject to the general laws of mechanics ?" [4]

---

[1] *Traité de la lumière*, Leyden, 1690, p. 2.

[2] L'on ne sçaurait douter que la lumière ne consiste dans le *mouvement* de certaine matière. Car soit qu'on regarde sa production, on trouve qu'içy sur la terre c'est principalement le feu et la flamme qui l'engendrent, lesquels contient sans doute des corps qui sont dans un mouvement rapide, puis qu'ils dissolvent et fondent plusieurs autres corps des plus solides : soit qu'on regarde ses effets, on voit que quand la lumière est ramasseé, comme par des miroires concaves, elle a la vertu de brûler comme le feu, c-est-à-dire qu'elle desunit les parties des corps; ce qui marque assurément du *mouvement*, au moins dans la *vraye Philosophie*, dans laquelle on conçoit la cause de tous les effets naturels par des raisons de *mechanique*. Ce qu'il faut faire à mon avis, ou bien renoncer à toute espérance de jamais rien comprendre dans la Physique."

[3] *Sur la puissance motrice du feu.* (Paris, 1824.)

[4] "On objectra peut-être ici que le mouvement perpétuel, démontré impossible par les *seules actions mécaniques*, ne l'est peut-être pas lorsqu'on emploie l'influence soit de la *chaleur*, soit de l'électricité ; mais peut-on concevoir les phénomènes de

These examples, which might be multiplied by quotations from recent literature indefinitely, show that a tendency to explain all things mechanically actually exists. This tendency is also intelligible. Mechanical events as simple motions in space and time best admit of observation and pursuit by the help of our highly organised senses. We reproduce mechanical processes almost without effort in our imagination. Pressure as a circumstance that produces motion is very familiar to us from daily experience. All changes which the individual personally produces in his environment or humanity brings about by means of the arts in the world, are effected through the instrumentality of *motions*. Almost of necessity, therefore, motion appears to us as the most important physical factor. Moreover, mechanical properties may be discovered in all physical events. The sounding bell trembles, the heated body expands, the electrified body attracts other bodies. Why, therefore, should we not attempt to grasp all events under their mechanical aspect, since that is so easily apprehended and most accessible to observation and measurement? In fact, no objection *is* to be made to the attempt to elucidate the properties of physical events by mechanical *analogies*.

But modern physics has proceeded *very far* in this direction. The point of view which Wundt represents in his very interesting treatise *On the Physical Axioms* is probably shared by the majority of physicists. The axioms of physics which Wundt sets up are as follows:

1. All natural causes are motional causes.
2. Every motional cause lies outside the object moved.
3. All motional causes act in the direction of the straight line of junction, and so forth.
4. The effect of every cause persists.
5. Every effect involves an equal countereffect.
6. Every effect is equivalent to its cause.

These principles might be studied properly enough as fundamental principles of mechanics. But when they are set up as axioms

---

la chaleur et de l'électricité comme dus à autre chose qu'à des *mouvements quelconques des corps* et comme tels ne doivent-ils pas être soumis aux lois générales de la mécanique?"

of physics, their enunciation is simply tantamount to a negation of all events except motion.

According to Wundt, all changes of nature are mere changes of place. All causes are motional causes (page 26). Any discussion of the philosophical grounds on which Wundt supports his theory would lead us deep into the speculations of the Eleatics and the Herbartians. Change of place, Wundt holds, is the *only* change of a thing in which a thing remains identical with itself. If a thing changed *qualitatively*, we should be obliged to imagine that something was annihilated and something else created in its place, which is not to be reconciled with our idea of the identity of the object observed and of the indestructibility of matter. But we have only to remember that the Eleatics encountered difficulties of exactly the same sort in motion. Can we not also imagine that a thing is destroyed in *one* place and in *another* an exactly similar thing created? After all, do we really know *more* why a body leaves one place and appears in another, than why a *cold* body grows *warm*? Granted that we had a perfect knowledge of the mechanical processes of nature, could we and should we, for that reason, *put out of the world* all other processes that we do not understand? On this principle it would be really the simplest course to deny the existence of the whole world. This is the point at which the Eleatics ultimately arrived, and the school of Herbart stopped little short of reaching the same goal.

Physics treated in this sense supplies us simply with a diagram of the world, in which we do not know reality again. It happens, in fact, to men who give themselves up to this view for many years, that the world of sense from which they start as a province of the great familiarity, suddenly becomes, in their eyes, the supreme "world-riddle."

Intelligible as it is, therefore, that the efforts of thinkers have always been bent upon the "reduction of all physical processes to the motions of atoms," it must yet be affirmed that this is a chimerical ideal. This ideal has often played an effective part in popular lectures, but in the workshop of the serious inquirer it has discharged scarcely the least function. What has really been achieved in mechan-

ical physics is either the *elucidation* of physical processes by more familiar *mechanical analogies*, (for example, the theories of light and of electricity,) or the exact *quantitative* ascertainment of the connexion of mechanical processes with other physical processes, for example, the results of thermodynamics.

III. THE PRINCIPLE OF ENERGY IN PHYSICS.

We can know only from *experience* that mechanical processes produce other physical transformations, or *vice versa*. The attention was first directed to the connexion of mechanical processes, especially the performance of work, with changes of thermal conditions by the invention of the steam-engine, and by its great technical importance. Technical interests and the need of scientific lucidity meeting in the mind of S. Carnot led to the remarkable development from which thermodynamics flowed. It is simply *an accident of history* that the development in question was not connected with the practical applications of *electricity*.

In the determination of the maximum quantity of *work* that, in general, a heat-machine, or, to take a special case, a steam-engine, can perform with the expenditure of a *given* amount of heat of combustion, Carnot is guided by mechanical analogies. A body can do work on being heated, by expansion under pressure. But to do this the body must receive heat from a *hotter* body. Heat, therefore, to do work, must pass from a hotter body to a colder body, just as water must fall from a higher level to a lower level to put a mill-wheel in motion. Differences of temperature, accordingly, represent forces able to do work exactly as do differences of height in heavy bodies. Carnot pictures to himself an ideal process in which no heat flows away unused, that is, without doing work. With a given expenditure of heat, accordingly, this process furnishes the maximum of work. An analogue of the process would be a mill-wheel which scooping its water out of a higher level would slowly carry it to a lower level without the loss of a drop. A peculiar property of the process is, that with the expenditure of the same work the water can be raised again exactly to its original level. This property of *reversibility* is also shared by the process of Carnot. His process

also can be reversed by the expenditure of the same amount of work, and the heat again brought back to its original temperature level.

Suppose, now, we had *two* different reversible processes A, B, such that in A a quantity of heat, Q, flowing off from the temperature t_1 to the lower temperature t_2 should perform the work W, but in B under the same circumstances it should perform a greater quantity of work, $W + W'$; then, we could join B in the sense assigned and A in the reverse sense into a *single* process. Here A would reverse the transformation of heat produced by B and would leave a surplus of work W', produced, so to speak, from nothing. The combination would present a perpetual motion.

With the feeling, now, that it makes little difference whether the mechanical laws are broken directly or indirectly (by processes of heat), and convinced of the existence of a *universal* law-ruled connexion of nature, Carnot here excludes for the first time from the province of *general* physics the possibility of a perpetual motion. *But it follows, then, that the quantity of work W, produced by the passage of a quantity of heat Q from a temperature t_1 to a temperature t_2, is independent of the nature of the substances as also of the character of the process, so far as that is unaccompanied by loss, but is wholly dependent upon the temperatures t_1, t_2.*

This important principle has been fully confirmed by the special researches of Carnot himself (1824), of Clapeyron (1834), and of Sir William Thomson (1849), now Lord Kelvin. The principle was reached *without any assumption whatever* concerning the nature of heat, simply by the exclusion of a perpetual motion. Carnot, it is true, was an adherent of the theory of Black, according to which the sum-total of the quantity of heat in the world is constant, but so far as his investigations have been hitherto considered the decision on this point is of no consequence. Carnot's principle led to the most remarkable results. W. Thomson (1848) founded upon it the ingenious idea of an "absolute" scale of temperature. James Thomson (1849) conceived a Carnot process to take place with water freezing under pressure and, therefore, performing work. He discovered, thus, that the freezing point is lowered $0{\cdot}0075^\circ$ Celsius by every additional atmosphere of pressure. This is mentioned merely as an example.

About twenty years after the publication of Carnot's book a further advance was made by J. R. Mayer and J. P. Joule. Mayer, while engaged as a physician in the service of the Dutch, observed, during a process of bleeding in Java, an unusual redness of the venous blood. In agreement with Liebig's theory of animal heat he connected this fact with the diminished loss of heat in warmer climates, and with the diminished expenditure of organic combustibles. The total expenditure of heat of a man at rest must be equal to the total heat of combustion. But since *all* organic actions, even the mechanical actions, must be placed to the credit of the heat of combustion, some connexion must exist between mechanical work and expenditure of heat.

Joule started from quite similar convictions concerning the galvanic battery. A heat of association equivalent to the consumption of the zinc can be made to appear in the galvanic cell. If a current is set up, a part of this heat appears in the conductor of the current. The interposition of an apparatus for the decomposition of water causes a part of this heat to disappear, which on the burning of the explosive gas formed, is reproduced. If the current runs an electromotor, a portion of the heat again disappears, which, on the consumption of the work by friction, again makes its appearance. Accordingly, both the heat produced and the work produced, appeared to Joule also as connected with the consumption of material. The thought was therefore present, both to Mayer and to Joule, of regarding heat and work as equivalent quantities, so connected with each other that what is lost in one form universally appears in another. The result of this was a *substantial* conception of heat and of work, and *ultimately a substantial conception of energy*. Here every physical change of condition is regarded as energy, the destruction of which generates work or equivalent heat. An electric charge, for example, is energy.

In 1842 Mayer had calculated from the physical constants then generally recognised that by the disappearance of one kilogramme-calorie 365 kilogrammetres of work could be performed, and *vice versa*. Joule, on the other hand, by a long series of delicate and varied experiments beginning in 1843 ultimately determined the

mechanical equivalent of the kilogramme-calorie, more exactly, as 425 kilogrammetres.

If we estimate every change of physical condition by the *mechanical work* which can be performed upon the *disappearance* of that condition, and call this measure *energy*, then we can measure all physical changes of condition, no matter how different they may be, with the same common measure, and say: *the sum-total of all energy remains constant.* This is the form that the principle of excluded perpetual motion received at the hands of Mayer, Joule, Helmholtz, and W. Thomson in its extension to the whole domain of physics.

After it had been proved that heat must *disappear* if mechanical work was to be done at its expense, Carnot's principle could no longer be regarded as a complete expression of the facts. Its improved form was first given, in 1850, by Clausius, whom Thomson followed in 1851. It runs thus: "If a quantity of heat Q' is transformed into work in a reversible process, *another* quantity of heat Q of the absolute[1] temperature T_1 is lowered to the absolute temperature T_2." Here Q' is dependent only on Q, T_1, T_2, but is independent of the substances used and of the character of the process, so far as that is unaccompanied with loss. Owing to this last fact, it is sufficient to find the relation which obtains for some one well-known physical substance, say a gas, and some definite simple process. The relation found will be the one which holds generally. We get, thus,

$$\frac{Q'}{Q'+Q} = \frac{T_1 - T_2}{T_1} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

that is, the quotient of the available heat Q' transformed into work divided by the sum of the transformed and transferred heats (the total sum used), the so-called *economical coefficient* of the process, is,

$$\frac{T_1 - T_2}{T_1}.$$

IV. THE CONCEPTIONS OF HEAT.

When a cold body is put in contact with a warm body it is observed that the first body is warmed and that the second body is

[1] By this is meant the temperature of a Celsius scale, the zero of which is 273° below the melting point of ice.

cooled. We may say that the first body is warmed *at the expense of* the second body. This suggests the notion of a thing, or heat-substance, which passes from the one body to the other. If two masses of water m, m', of unequal temperatures, be put together, it will be found, upon the rapid equalisation of the temperatures, that the respective changes of temperatures u and u' are inversely proportional to the masses and of opposite signs, so that the algebraical sum of the products is,

$$m u + m' u' = 0.$$

Black called the products $m u$, $m' u'$, which are decisive for our knowledge of the process, *quantities of heat*. We may form a very clear *picture* of these products by conceiving them with Black as measures of the quantities of some substance. But the essential thing is not this picture but the *constancy* of the sum of these products in simple processes of conduction. If a quantity of heat disappears at one point, an equally large quantity will make its appearance at some other point. The retention of this idea leads to the discovery of specific heat. Black, finally, perceives that also something else may appear for a vanished quantity of heat, namely: the fusion or evaporation of a definite quantity of matter. He adheres here still to his favorite view, though with some freedom, and considers the vanished quantity of heat as still present, but as *latent*.

The generally accepted notion of a caloric, or heat-stuff, was strongly shaken by the work of Mayer and Joule. If the quantity of heat can be increased and diminished, people said, heat cannot be a substance, but must be a *motion*. The subordinate part of this statement has become much more popular than all the rest of the doctrine of energy. But we may convince ourselves that the motional conception of heat is now as unessential as was formerly its conception as a substance. Both ideas were favored or impeded solely by accidental historical circumstances. It does not follow that heat is not a substance from the fact that a mechanical equivalent exists for quantity of heat. We will make this clear by the following question which bright students have sometimes put to me. Is there a mechanical equivalent of electricity as there is a mechanical equivalent of heat? Yes, and no. There is no mechanical equivalent of

quantity of electricity as there is an equivalent of *quantity* of heat, because the same quantity of electricity has a very different capacity for work, according to the circumstances in which it is placed; but there *is* a mechanical equivalent of electrical energy.

Let us ask another question. Is there a mechanical equivalent of water? No, there is no mechanical equivalent of quantity of water, but there is a mechanical equivalent of weight of water multiplied by its distance of descent.

When a Leyden jar is discharged and work thereby performed, we do not picture to ourselves that the quantity of electricity disappears as work is done, but we simply assume that the electricities come into different positions, equal quantities of positive and negative electricity being united with one another.

What, now, is the reason of this difference of view in our treatment of heat and of electricity? The reason is purely historical, wholly conventional, and, what is still more important, is wholly indifferent. I may be allowed to establish this assertion.

In 1785 Coulomb constructed his torsion balance, by which he was enabled to measure the repulsion of electrified bodies. Suppose we have two small balls, A, B, which over their whole extent are similarly electrified. These two balls will exert on one another, at a certain distance r of their centres, a certain repulsion p. We bring into contact with B now a ball C, suffer both to be equally electrified, and then measure the repulsion of B from A and of C from A at the same distance r. The sum of these repulsions is again p. Accordingly something has remained constant. If we ascribe this effect to a substance, then we infer naturally its constancy. But the essential point of the exposition is the divisibility of the electric force p and not the simile of substance.

In 1838 Riess constructed his electrical air-thermometer (thermoelectrometer). This gives a measure of the quantity of heat produced by the discharge of jars. This quantity of heat is not proportional to the quantity of electricity contained in the jar by Coulomb's measure, but if q be this quantity and c be the capacity, is proportional to $q^2\ 2c$, or, more simply still, to the energy of the charged jar. If, now, we discharge the jar completely through the thermo-

meter, we obtain a certain quantity of heat, *W*. But if we make the discharge through the thermometer into a second jar, we obtain a quantity less than *W*. But we may obtain the remainder by completely discharging both jars through the air-thermometer, when it will be again proportional to the energy of the two jars. On the first, incomplete discharge, accordingly, a part of the electricity's capacity for work was lost.

When the charge of a jar produces heat its energy is changed and its value by Riess's thermometer is decreased. But by Coulomb's measure the quantity remains unaltered.

Now let us imagine that Riess's thermometer was invented before Coulomb's torsion balance, which is not a difficult feat, since both inventions are independent of each other; what would be more natural than that the "quantity" of electricity contained in a jar should be measured by the heat produced in the thermometer? But then, this so-called quantity of electricity would decrease on the production of heat or on the performance of work, whereas it now remains unchanged; in that case, therefore, electricity would not be a *substance* but a *motion*, whereas it is now still a substance. The reason, therefore, why we have other notions of electricity than we have of heat, is purely historical, accidental, and conventional.

This is also the case with other physical things. Water does not disappear when work is done. Why? Because we measure quantity of water with scales, just as we do electricity. But suppose the capacity of the water for work were called quantity, and had to be measured, therefore, by a mill instead of by scales; then this quantity also would disappear as it performed the work. It may, now, be easily conceived that many substances are not so easily got at as water. In that case we should be unable to carry out the one kind of measurement with the scales whilst many other modes of measurement would still be left us.

In the case of heat, now, the historically established measure of "quantity" is accidentally the work-value of the heat. Accordingly, its quantity disappears when work is done. But that heat is not a substance follows from this as little as does the opposite conclusion that it is a substance. In Black's case the quantity of

heat remains constant because the heat passes into no *other* form of energy.

If any one to-day should still wish to think of heat as a substance, we might allow that person this liberty with little ado. He would only have to assume that that which we call quantity of heat was the energy of a substance whose quantity remained unaltered, but whose energy changed. In point of fact we might much better say, in analogy with the other terms of physics, energy of heat, instead of quantity of heat.

When we wonder, therefore, at the discovery that heat is motion, we wonder at something that was never discovered. It is perfectly indifferent and possesses not the slightest scientific value, whether we think of heat as a substance or not. The fact is, heat behaves in some connexions like a substance, in others not. Heat is latent in steam as oxygen is latent in water.

V. THE CONFORMITY IN THE DEPORTMENT OF THE ENERGIES.

The foregoing reflexions will gain in lucidity from a consideration of the conformity which obtains in the behavior of all energies, a point to which I called attention long ago.[1]

A weight P at a height H_1 represents an energy $W_1 = PH_1$. If we suffer the weight to sink to a lower height H_2, during which work is done, and the work done is employed in the production of living force, heat, or an electric charge, in short is transformed, then the energy $W_2 = PH_2$ is still *left*. The equation subsists,

$$\frac{W_1}{H_1} = \frac{W_2}{H_2}, \quad \ldots \ldots \ldots \ldots \ldots \ldots \quad (2)$$

or, denoting the *transformed* energy by $W' = W_1 - W_2$ and the *transferred* energy, that transported to the lower level, by $W = W_2$,

$$\frac{W'}{W' + W} = \frac{H_1 - H_2}{H_1}, \quad \ldots \ldots \ldots \ldots \ldots \quad (3)$$

[1] I first drew attention to this fact in my treatise *Ueber die Erhaltung der Arbeit*, Prague, 1872. Before this, Zeuner had pointed out the analogy between mechanical and thermal energy. I have given a more extensive development of this idea in a communication to the *Sitzungsberichte der Wiener Akademie*, December, 1892, entitled *Geschichte und Kritik des Carnot'schen Wärmegesetzes*. Compare also the works of Popper (1884), Helm (1887), Wronsky (1888), and Ostwald (1892).

an equation in all respects analogous to equation (1) at page 41. The property in question, therefore, is by no means peculiar to heat. Equation (2) gives the relation between the energy taken from the higher level and that deposited on the lower level (the energy left behind); it says that these *energies* are proportional to the *heights of the levels*. An equation analogous to equation (2) may be set up for *every* form of energy; hence the equation which corresponds to equation (3), and so to equation (1), may be regarded as valid for every form. For electricity, for example, H_1, H_2 signify the potentials.

When we observe for the first time the agreement here indicated in the transformative law of the energies, it appears surprising and unexpected, for we do not perceive at once its reason. But to him who pursues the comparative historical method that reason will not long remain a secret.

Since Galileo, mechanical work, though long under a different name, has been a *fundamental concept* of mechanics, as also a very important notion in the applied sciences. The transformation of work into living force, and of living force into work, suggests directly the notion of energy—the idea having been first fruitfully employed by Huygens, although Thomas Young first called it by the *name* of "energy." Let us add to this the constancy of weight (really the constancy of mass) and we shall see that with respect to mechanical energy it is involved in the very definition of the term that the capacity for work or the potential energy of a weight is proportional to the height of the level at which it is, in the geometrical sense, and that it decreases on the lowering of the weight, on transformation, proportionally to the height of the level. The zero level here is wholly arbitrary. With this, equation (2) is given, from which all the other forms follow.

When we reflect on the tremendous start which mechanics had over the other branches of physics, it is not to be wondered at that the attempt was always made to apply the notions of that science wherever this was possible. Thus the notion of mass, for example, was imitated by Coulomb in the notion of the quantity of electricity. In the further development of the theory of electricity,

the notion of work was likewise immediately introduced in the theory of potential, and heights of electrical level were measured by the work of unit of quantity raised to that level. But with this the preceding equation with all its consequences is given for electrical energy. The case with the other energies was similar.

Thermal energy, however, appears as a special case. Only by the peculiar experiments mentioned could it be discovered that heat is an energy. But the measure of this energy by Black's quantity of heat is the outcome of fortuitous circumstances. In the first place, the accidental slight variability of the capacity for heat c with the temperature, and the accidental slight deviation of the usual thermometrical scales from the scale derived from *the tensions of gases*, brings it about that the notion "quantity of heat" can be set up and that the quantity of heat ct corresponding to a difference of temperature t is nearly proportional to the energy of the heat. It is a quite accidental historical circumstance that Amontons hit upon the idea of measuring temperature by the tension of a gas. It is certain in this that he did not think of the work of the heat.[1] But the numbers standing for temperature, thus, are made proportional to the tensions of gases, that is, to the work done by gases, with otherwise equal changes of volume. It thus happens that *temperature heights* and *level heights of work* are proportional to one another.

If properties of the thermal condition varying greatly from the tensions of gases had been chosen, this relation would have assumed very complicated forms, and the agreement between heat and the other energies above considered would not subsist. It is very instructive to reflect upon this point. A *natural law*, therefore, is not implied in the conformity of the behavior of the energies, but this conformity is rather conditioned by the uniformity of our modes of conception and is also partly a matter of good fortune.

[1] Sir William Thomson first consciously and intentionally introduced (1848, 1851) a *mechanical* measure of temperature similar to the electric measure of potential.

VI. THE DIFFERENCES OF THE ENERGIES AND THE LIMITS OF THE PRINCIPLE OF ENERGY.

Of every quantity of heat Q which does work in a reversible process (one unaccompanied by loss) between the absolute temperatures T_1 T_2, only the portion

$$\frac{T_1 - T_2}{T_1}$$

is transformed into work, while the remainder is transferred to the lower temperature-level T_2. This transferred portion can, upon the reversal of the process, with the same expenditure of work, again be brought back to the level T_1. But if the process is not reversible, then more heat than in the foregoing case flows to the lower level, and the surplus can no longer be brought back to the higher level T_2 without some *special* expenditure. W. Thomson (1852), accordingly, drew attention to the fact, that in all non-reversible, that is, in all real thermal processes, quantities of heat are lost for mechanical work, and that accordingly a dissipation or waste of mechanical energy takes place. In all cases, heat is only partially transformed into work, but frequently work is wholly transformed into heat. Hence, a tendency exists towards a diminution of the *mechanical* energy and towards an increase of the *thermal* energy of the world.

For a simple, closed cyclical process, accompanied by no loss, in which the quantity of heat Q_1 is taken from the level T_1, and the quantity Q_2 is given to the level T_2, the following relation, agreeably to equation (2), exists,

$$-\frac{Q_1}{T_1} + \frac{Q_2}{T_2} = 0.$$

Similarly, for any number of compound reversible cycles Clausius finds the algebraical sum

$$\Sigma \frac{Q}{T} = 0,$$

and supposing the temperature to change continuously,

$$\int \frac{dQ}{T} = 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (4)$$

Here the elements of the quantities of heat deducted from a given level are reckoned negative, and the elements imparted to it, positive. If the process is not reversible, then expression (4), which Clausius calls *entropy*, increases. In actual practice this is always the case, and Clausius finds himself led to the statement:

1. That the energy of the world remains constant.
2. That the entropy of the world tends toward a maximum.

Once we have noted the above-indicated conformity in the behavior of different energies, the *peculiarity* of thermal energy here mentioned must strike us. Whence is this peculiarity derived, for, generally every energy passes only partly into another form, as does thermal energy? The explanation will be found in the following.

Every transformation of a special kind of energy A is accompanied with a fall of potential of that particular kind of energy, including heat. But whilst for the other kinds of energy a transformation and therefore a loss of energy on the part of the kind sinking in potential is connected with the fall of the potential, with heat the case is different. Heat can suffer a fall of potential without sustaining a loss of energy, at least according to the customary mode of estimation. If a weight sinks, it must create perforce kinetic energy, or heat, or some other form of energy. Also, an electrical charge cannot suffer a fall of potential without loss of energy, i. e., without transformation. But heat can pass with a fall of temperature to a body of greater capacity and the same thermal energy still be preserved, so long as we regard *every quantity* of heat as energy. This it is that gives to heat, besides its property of energy, in many cases the character of a material *substance*, or quantity.

If we look at the matter in an unprejudiced light, we must ask if there is any scientific sense or purpose in still considering as energy a quantity of heat that can no longer be transformed into mechanical work, (for example, the heat of a closed equably warmed material system). The principle of energy certainly plays in this case a wholly superfluous rôle, which is assigned to it only from habit.[1] To maintain the principle of energy in the face of a knowl-

[1] Compare my *Analyse der Empfindungen*, 1886.

edge of the dissipation or waste of mechanical energy, in the face of the increase of entropy is equivalent almost to the liberty which Black took when he regarded the heat of liquefaction as still present but latent.[1] It is to be remarked further, that the expressions, "energy of the world" and "entropy of the world," are slightly permeated with scholasticism. Energy and entropy are *metrical* notions. What meaning can there be in applying these notions to a case in which they are not applicable, in which their values are not determinable?

If we could really determine the entropy of the world it would represent a true, absolute measure of time. In this way is best seen the utter tautology of a statement that the entropy of the world increases with the time. Time, and the fact that certain changes take place only in a definite sense, are one and the same thing.

VII. THE SOURCES OF THE PRINCIPLE OF ENERGY.

We are now prepared to answer the question, What are the sources of the principle of energy? All knowledge of nature is derived in the last instance from experience. In this sense they are right who look upon the principle of energy as a result of experience.

Experience teaches that the sense-elements $\alpha\ \beta\ \gamma\ \delta\ \ldots$ into which the world may be decomposed, are subject to change. It tells us further, that certain of these elements are *connected* with other elements, so that they appear and disappear together; or, that the appearance of the elements of one class is connected with the disappearance of the elements of the other class. We will avoid here the notions of cause and effect on account of their obscurity and equivocalness. The result of experience may be expressed as fol-

[1] A better terminology appears highly desirable in the place of the usual perplexing one. Sir Wm. Thomson (1852) appears to have felt this need, and it has been clearly expressed by F. Wald (1889). We should call the work which corresponds to a vanished quantity of heat its mechanical substitution-value; while that work which can be *actually* performed in the passage of a thermal condition A to a condition B, alone deserves the name of the *energy-value* of this change of condition. In this way the *arbitrary* substantial conception of the processes would be preserved and misapprehensions forestalled.

lows: *The sensuous elements of the world* ($\alpha\,\beta\,\gamma\,\delta\,\ldots$) *show themselves to be interdependent.* This interdependence is best represented by some such conception as is in geometry that of the mutual dependence of the sides and angles of a triangle, only much more varied and complex.

As an example, we may take a mass of gas enclosed in a cylinder and possessed of a definite volume (α), which we change by a pressure (β) on the piston, at the same time feeling the cylinder with our hand and receiving a sensation of heat (γ). Increase of pressure diminishes the volume and increases the sensation of heat.

The various facts of experience are not in all respects alike. Their common sensuous elements are placed in relief by a process of abstraction and thus impressed upon the memory. In this way the expression is obtained of the features of *agreement* of entire groups of facts. The simplest sentence which we can utter is, from the very nature of language, an abstraction of this kind. But account must also be taken of the *differences* of related facts. Facts may be so nearly related as to contain the same kind of $\alpha\,\beta\,\gamma\,\ldots$ but the relation be such that the $\alpha\,\beta\,\gamma\,\ldots$ of the one differ from the $\alpha\,\beta\,\gamma\,\ldots$ of the other only by the number of equal parts into which they can be divided. Such being the case, if rules can be given for deducing *from one another* the numbers which are the measures of these $\alpha\,\beta\,\gamma\,\ldots$, then we possess in such rules the *most general* expression of a group of facts, as also that expression which corresponds to all its differences. This is the goal of quantitative investigation.

If this goal is reached what we have found is that between the $\alpha\,\beta\,\gamma\,\ldots$ of a group of facts, or better, between the numbers which are their measures, a number of equations exists. The simple fact of change brings it about that the number of these equations must be smaller than the number of the $\alpha\,\beta\,\gamma\,\ldots$ If the former be smaller by one than the latter, then one portion of the $\alpha\,\beta\,\gamma\,\ldots$ is *uniquely* determined by the other portion.

The quest of relations of this last kind is the most important function of special experimental research, because we are enabled by it to complete in thought facts that are only partly given. It is self-evident that only experience can ascertain that between the

$\alpha\beta\gamma\ldots$ relations exist and of what kind they are. Further, only experience can tell that the relations that exist between the $\alpha\beta\gamma\ldots$ are such that changes of them can be reversed. If this were not the fact all occasion for the enunciation of the principle of energy, as is easily seen, would be wanting. In experience, therefore, is buried the ultimate well-spring of all knowledge of nature, and consequently, in this sense, also the ultimate source of the principle of energy.

But this does not exclude the fact that the principle of energy has also a logical root, as will now be seen. Let us assume on the basis of experience that one group of sensuous elements $\alpha\beta\gamma\ldots$ determines *uniquely* another group $\lambda\mu\nu\ldots$ Experience further teaches that changes of $\alpha\beta\gamma\ldots$ can be *reversed*. It is then a logical consequence of this observation, that every time that $\alpha\beta\gamma\ldots$ assume the same values this is also the case with $\lambda\mu\nu\ldots$ Or, that purely *periodical* changes of $\alpha\beta\gamma\ldots$ can produce no *permanent* changes of $\lambda\mu\nu\ldots$ If the group $\lambda\mu\nu\ldots$ is a mechanical group, then a perpetual motion is excluded.

It will be said that this is a vicious circle, which we will grant. But psychologically, the situation is essentially different, whether I think simply of the unique determination and reversibility of events, or whether I exclude a perpetual motion. The attention takes in the two cases different directions and diffuses light over different sides of the question, which logically of course are necessarily connected.

Surely that firm, logical setting of the thoughts noticeable in the great inquirers, Stevinus, Galileo, and the rest, which, consciously or instinctively, was supported by a fine feeling for the slightest contradictions, has no other purpose than to limit the bounds of thought and so exempt it from the possibility of error. In this, therefore, the logical root of the principle of excluded perpetual motion is given, namely, in that universal conviction which existed even before the development of mechanics and co-operated in that development.

It is perfectly natural that the principle of excluded perpetual motion should have been first developed in the simple domain of

pure mechanics. Towards the transference of that principle into the domain of general physics the idea contributed much that all physical phenomena are mechanical phenomena. But the foregoing discussion shows how little essential this notion is. The issue really involved is the recognition of a general interconnexion of nature. This once established, we see with Carnot that it is indifferent whether the mechanical laws are broken directly or circuitously.

The principle of the excluded perpetual motion is very closely related to the modern principle of energy, but it is not identical with it, for the latter is to be deduced from the former only by means of a definite *formal conception.* As may be seen from the preceding exposition, the perpetual motion can be excluded without our employing or possessing the notion of *work.* The modern principle of energy results primarily from a *substantial* conception of work and of every change of physical condition which by being reversed produces work. The strong need of such a conception, which is by no means necessary, but in a formal sense is very convenient and lucid, is exhibited in the case of J. R. Mayer and Joule. It was before remarked that this conception was suggested to both inquirers by the observation that both the production of heat and the production of mechanical work was connected with an expenditure of substance. Mayer says: "Ex nihilo nil fit," and in another place, "The creation or destruction of a force (work) lies beyond the domain of human activity." In Joule we find this passage: "It is manifestly *absurd* to suppose that the powers with which God has endowed matter can be destroyed."

Some writers have observed in such statements the attempt at a *metaphysical* establishment of the doctrine of energy. But we see in them simply the formal need of a simple, clear, and living grasp of the facts, which receives its development in practical and technical life, and which we carry over, as best we can, into the province of science. As a fact, Mayer writes to Griesinger: "If, finally, you ask me how I got involved in the whole affair, my answer is simply this: Engaged during a sea voyage almost exclusively with the study of physiology, I discovered the new theory for the sufficient reason that I *vividly felt the need of it.*"

The substantial conception of work (energy) is by no means a necessary one. And it is far from true that the problem is solved with the recognition of the need of such a conception. Rather let us see how Mayer gradually endeavored to satisfy that need. He first regards quantity of motion, or momentum, mv, as the equivalent of work, and did not light, until later, on the notion of living force ($mv^2/2$). In the province of electricity he was unable to assign the expression which is the equivalent of work. This was done later by Helmholtz. The formal need, therefore, is *first* present, and our conception of nature is subsequently gradually *adapted* to it.

The laying bare of the experimental, logical, and formal root of the present principle of energy will perhaps contribute much to the removal of the mysticism which still clings to this principle. With respect to our formal need of a very simple, palpable, substantial conception of the processes in our environment, it remains an open question how far nature corresponds to that need, or how far we can satisfy it. In one phase of the preceding discussions it would seem as if the substantial notion of the principle of energy, like Black's material conception of heat, has its natural limits in facts, beyond which it can only be artificially adhered to.

ERNST MACH.

UNIVERSITY OF PRAGUE.

ON THE NATURE OF MOTION.

SCIENTIFIC philosophy seems to be crystallising about the doctrine of the conservation of energy as its unifying principle. It also seems to be taking the form that forces are the collisions of matter due to motion. This doctrine is not universally accepted but it has been propounded and is already widely accepted and it seems to be growing in favor by reason of its great simplicity and because it furnishes an explanation of many facts and a conceivable explanation for many more, but chiefly from the consideration which is all important, that motion is a real cause of force attested again and again. No other explanation of forces is propounded except as a reification of abstractions inherited from the ontologic age of metaphysics, and still found as an atavism in philosophy.

It is not proposed here to discuss the conservatism of energy nor the kinematic hypothesis that force is the collision of matter in motion, but to assume the theory for the purpose of exhibiting one of its logical consequences.

Every particle of matter known to man is in motion at a high velocity. This wooden ball is in motion about the axis of the earth, about the sun, and also with the sun about some other point in the heavens. The sum of all these motions considered as velocity is unknown, but this may be affirmed with safety, that it is very great. Let us call this the stellar motion of the ball. Its trajectory is composed of at least three great revolutions.

Great as the velocity of the stellar motion is, it is yet small as compared with other motions within the body itself. As now understood the woody tissue is composed of cells, the cells of mole-

cules and the molecules of atoms, all grouped in such a manner by composed motion as to constitute a tissue whose structure is dependent upon molecular motions. That rigidity is sometimes due to motion is well known. Stand by the nozzle of a monitor with four hundred feet of pressure behind the water and watch the stream drive the great boulder away. Strike this stream with a crowbar; though the iron may bend the stream is unbroken. So we may conceive that rigidity and strength of structure are properties of motion. Let us call this rigidity and structural strength of the woody tissue constitutional motion, whose force is equal to the sum necessary to rend the ball into its constituent atoms. The structural strength is a measure of its constitutional motion which is great as compared with any molar motion observed in the ball. Again, the body exhibits a mode of motion known as heat which is undulatory or vibratory. Something of the velocity of heat is known and it is well known that it is very great as compared with the molar motion observed in the bodies which furnish the heat. Let us call this structural and thermic motion molecular motion.

I roll the ball over the floor and molar motion is exhibited to the vision.

Thus we know of three kinds of motion possessed by the body, but that which is apparent to the unaided vision is but a minute part of the whole. It is evident that it is a very small part of the stellar motion. Let us now see what proportion it bears to the molecular or the constitutional and thermic motion combined. The constitutional motion is measured by the force with which the atoms, molecules, and cells are held together as an organic body. If we attempt to realise this we find it very great, yet we cannot attain to its measure from the fact that it is complicated with the heat motion of the body, but we can obtain some realisation of the sum of the two kinds of motion, though we cannot with certainty divide the cryptic motion between them.

Let the ball be burned and its atoms set free into the air. The disturbance which they cause as they depart is known as light. The light travels at more than a hundred thousand miles per second, that is, it causes a disturbance in the ether which is propagated at

that rate by the collisions of the atoms against the particles of ether. There are conditions under which this light may travel at the rate of five hundred thousand miles per second. Now, that these atoms may cause such collisions they must be moving at least at an equal rate at the instant they dissolve from the wooden ball. The constitutional motion of the body transformed into heat and added to its original heat therefore, must equal the light motion which the burning ball produces. Hence we must conclude that the molecular motion of the ball must be at a rate of at least a hundred thousand to five hundred thousand miles per second. Add this motion, whatever it may be, to the stellar motion, whatever it may be, and the sum is very great.

None of these motions are persistently right line motions. It is manifest that the stellar motions are great revolutions. The constitutional motions are also enormously composite. The heat motions, though they may be right-line motions in minute parts, must be composite motion—their paths forever changing, else the body would be dissipated. The molecular motion of each molecule in the body, though proceeding at a high velocity, greater than a hundred thousand miles per second, has its path or trajectory confined to the sphere of the molecule itself. Considering this molecular motion, not in relation to stellar motion nor in relation to molar motion, but wholly in its relation to the particles of the molecule, it must be highly composite. The molar motion of the rolling ball is revolution and translation, but it is so small as compared with the others that it hardly seems worthy of consideration. Still it must not be neglected, for this is the motion the characteristics of which we have set out to explain. Let us once more consider what has been said. The atoms of the ball when all their motions are analysed and summed prove to have enormous velocities in enormously composite paths compared with which the molar motion of the ball on the floor sinks into insignificance.

Every particle in the wooden ball rolling on the floor has stellar motion, molecular motion, and molar motion. Consider one of these particles moving with the three kinds of motion and we realise that its velocity is very great, and that the path which it trav-

erses is greatly composite. If such a particle had its composite path straightened into a right-line trajectory, it would in a few seconds pass out of the sphere of the solar system into a region beyond, from whatever point within the system it might start and in whatever direction the right-line path extended. But the molecule remains within the solar system because its stellar motion is composite, and it remains within the ball because its molar motion is composite, and it remains within the molecule because its molecular motion is composite. We have, thus, with regard to every one of the particles of the ball, two facts of motion to consider: First, great velocity, second, great complexity of path.

Every collision of one atom with another must produce an effect upon both. The particles *A* and *B* collide. *A* acts on *B* and *B* on *A*, so that there is both action and reaction in each, and action and passion in each. The action of *A* equals the reaction of *A*. The action of *B* equals the reaction of *B*. The action of *A* equals the passion on *B*, and the action of *B* equals the passion on *A*, thus there is a double correlative.

By such a collision no motion can be acquired and no motion can be lost; for motion is indestructible by our hypothesis; but the effect of the collision will certainly be a change in direction or deflection. We know of deflection, but is there something else beside deflection? In the current doctrines of physics a something else is affirmed or assumed, that something else being an increase of the velocity of one body accompanied by an equal decrease of velocity in the other, which invalidates the law of motion, that action and reaction are equal; and thus a contradiction is reached. If one of the particles gains motion its action is less than its reaction; if one loses motion its reaction is less than its action. If action and reaction are equal, then neither of the colliding particles can have its velocity increased or diminished. In this double correlative of action and reaction and action and passion the truth must be found and the lurking error discovered.

But the wooden ball was set rolling. Was not motion as velocity added to the ball when it started and subtracted from it when it was stopped?

When the ball was started molar motion began and when stopped that molar motion ended. But we do not suppose that it came out of nothing and evanished in nothing; we resort to pre-existing molecular motion to explain it; we say that the molar motion was derived from the molecular motion of the hand that set the ball rolling and that it was transformed into molecular motion in the wall which destroyed the molar motion. In making this explanation we assume that motion went out of the hand into the ball and then out of the ball into the wall. Is this true? Was the velocity of the molecular motion in the hand diminished and the velocity of the molecular motion in the wall increased? If so, action and reaction are not equal.

Did velocity go out of the hand into the ball, or was the mode of motion existing in the ball changed? Did velocity go out of the ball into the wall or was the mode of motion existing in the wall changed? If the law of action and reaction is valid, when the change was made upon the ball by the hand, an equal change was made upon the hand by the ball. Neither of them lost velocity by the changed form. When the ball struck the wall neither ball nor wall lost velocity, but both changed their mode of motion by collision. The form or mode of motion was affected, the quantity of motion as velocity was unaffected. But there was a change in the hand, in the ball, and in the wall. In what did that change consist? We know that in part at least it consisted in the change of direction. The molecular motions in the hand must have had their directions changed; the molecular motions in the ball must have had their directions changed; in like manner the molecular motions of the wall were changed in direction. This we know: in every collision there is a change of direction in the motion of the particles constituting the bodies colliding. Is this change of direction all? Or is there a transference of velocity so that one loses while another gains? The whole problem is narrowed to this issue—that which we call acceleration is wholly deflection or in part deflection and in part loss and gain—loss of velocity by one and gain by another, and if there is any loss and gain then action and reaction are not equal.

Imagine a man walking in a circle of ten feet radius. The

sphere of his motion is within that circumference. He may soon walk a mile and never be more than thirty feet away from any given point in the circumference; change his direction so that his path is straightened, and he may soon be a mile away. A body of men walking in a circle remain together as a body within the circumference of the circle. Instantaneously change their paths to parallel right lines, and as a body they may soon be a mile away and still in a circle. In the same manner the molecules of the wooden ball are in motion within the theatre of the ball, so that they do not pass beyond its boundaries, yet impose upon each molecule a change of direction in such manner that they all move a little more in one course and a translation of the ball is effected by a change of direction in the motion of its constituent molecules, and the ball still remains as an incorporate body. It is thus possible to explain molar motion of the ball as a change in direction of the motion of its molecular parts, without assuming an increase of velocity in the parts. By such an assumption the molar motion perceived by vision would be legitimately derived from the molecular motion known by reason; no motion would be created or destroyed, and action and reaction would remain equal, while the apparent molar motion would be explained by a change of direction very minute as compared with the composite paths of the several molecules. It is thus that when we consider the total motions of the atoms of the ball even when it is shot from a cannon's mouth, an inconceivably small change of direction in the motion of every atom as compared with the complexity of its path would fully account for the flight of the ball as projected by dynamite.

Now we know of deflection and that it arises from collision, and we know of no other change in motion. Acceleration as increase of velocity cannot in the nature of the case be demonstrated, for it may be always explained as deflection and can never be explained without deflection; and to assume acceleration as increase of velocity is to contradict the law that action and reaction are equal. If acceleration is explained as deflection it is explained by referring it to a known cause and adequately explained.

The pendulum swings. Its molar motion seems to come to

rest. Gradually it moves again on its return path, and the swing is repeated over and over. Apparently its motion is destroyed and created at every vibration, and this is true of its molar motion. But now we must consider that this seen vibration is but a part of its motion. It has stellar and molecular motion. It is a body composed of many atoms, and the molar motion constitutes but a minute part of the total motion. To properly understand its motion of swing we must discover the relation of this minute part to the grand total. Are we sure that velocity is added to the grand total, or is it a change in the direction of the multiform motions of the body, stellar, constitutional, and thermic, of inconceivable minuteness? For it is possible thus to explain the molar motion. We know that the direction of motion can be changed, and we resort to a known cause in thus explaining it. If we attempt to explain it as an increase in velocity we resort to an unknown cause, for it can never be shown that any change in motion is increase of velocity. If the third law of motion is true our explanation is valid.

But the pendulum was set in molar motion by a collision with the hand, and it returns to apparent rest after many collisions with the molecules of the air. That which was made to appear to the vision as molar motion was derived from collision and is lost in collision. Did anything but collision go out of the hand through the pendulum and into the air? Was the velocity of the air-particles permanently increased thereby and the velocity of the hand-particles permanently diminished thereby? This is the problem we are seeking to solve. If motion left the hand and was discharged into the air, then motion may be dissipated and the first law of motion is an illusion ; but if the changes wrought are explained as collisions, then the law remains and the illusion is one of the sense of vision, easily and simply explained ; for vision takes no cognisance of stellar and molecular motion but only of the molar motion ; and we are compelled to resort to our knowledge of cryptic motion in order to explain the movements of the pendulum as being other than a creation out of nothing and an annihilation into nothing. The explanation by vision is held to be absurd, but if we go beyond vision into the realm of reason we discover that motion can never be created

nor destroyed, and we discover still further that action and reaction are equal and that therefore one particle of matter can never yield its motion to another. But vision and reason alike testify to the existence of collision and to the deflection which results therefrom, and hence we are compelled to believe that the apparent motion of the pendulum was not created for the occasion nor borrowed for the occasion but only deflected for the occasion.

Yet, again, this ball of wax is before the fire; the fire gives it heat and the wax is warmed until at last it melts. In the flame constitutional motion is transformed into heat, this heat is radiated through the ether to the wax; the wax itself becomes heated and melts. Does some motion in the gas depart therefrom and pass into the wax? Or do the atoms of the flame collide against the atoms of the ether which again collide against the atoms of the wax in such a manner that the constitutional motion of the wax is transformed into thermic motion? The latter is the explanation which must be given under the hypothesis that motion is persistent in each particle and that collision results only in change of direction. By such explanation we resort to a known cause of change; but if motion itself is transmitted by collision and not simply change of direction, then the law of action and reaction is disproved. The hypothesis of persistent motion in the presence of Newton's third law of motion compels us to the conclusion that collision occurs which results only in change of direction, that the force of heat is collision resulting from motion which persistently inheres in the several particles and which produces an effect upon the particles composing the body heated, and that this effect is a change in the direction of the motion of its molecular particles in such a manner that constitutional motion is transformed into thermic motion.

The motion of the heat in the flame was derived from the constitutional motion of the wood in the grate. Was any motion transmitted? Gather the particles of combustion and we have gases in which motions are discovered equivalent as forces to the structural forces of the wood itself, and these are known as the kinetic forces of the gas. The motion in the wood equals the motion in the gas, for action and reaction are equal.

All explained forces are found to be collisions. Perhaps gravity cannot thus be explained but there are many physicists who believe that it can thus be explained by transforming the theory of La Sage from terms of a fluid to terms of motion. By this explanation gravity would be explained as collision through the interception of collisions by the gravitating bodies. With this explanation the law of gravity is explained and remains valid and there appears to be no substantial reason for the rejection of this gravitational theory.

In all nature we discover these antagonistic forces; constitutional force and thermic force. If thermic force is greater, constitutional force is less; the body tends to dissolve or is dissolved. And *vice versa*, if the thermic motion is diminished, the constitutional motion is increased, and in no case can it be shown that one is increased without the other being diminished. The heating of the body therefore adds nothing to its motion but only transforms the motion which it already has into another mode. And *vice versa*, the same is true with any cooling process. When we come to consider all the motions of the body we never have reason to suppose that the total is increased or diminished. No increase or diminution can ever be discovered but we always have substantial reasons to suppose that directions are changed and every change of motion can be accounted for as change of direction, and the third law of motion remains valid.

It thus appears that to interpret acceleration as increase of velocity rather than as deflection is to fall into an illusion of the senses, which unaided deal only with molar forms of motion, and it should be further considered that these molar forms with which the senses deal constitute but an infinitesimal part of the total motions inhering in every body of matter. We know of acceleration as deflection, we do not know acceleration as increase of velocity, and there can be no increase of velocity if the third law of motion is valid. It is well recognised in modern physics that acceleration is sometimes deflection, but it is sometimes held to be increase of velocity, and it is believed that in so far as it is increase of velocity it is not deflection, and in so far as it is deflection it is not increase of

velocity. But claim is here made as a universal law that acceleration is deflection.

Let this argument be stated in brief:

First, the tendency of modern investigation is to explain all forces as derived from modes of motion. Great progress has been made in this direction and the theory is widely accepted.

Second, all forces are collisions.

Third, if all forces are collisions the motions from which they result obey the third law of motion, that action and reaction are equal. By this law it is seen that no motion can be lost or gained by any particle of matter.

Fourth, collisions can be transmitted but motion cannot be transmitted.

Fifth, in molar motion there is an apparent creation and annihilation of motion, but this appearance is known to be an illusion. It has been explained as due in part to collision and in part to the transmission of motion. But such transmission contradicts the third law of motion. Acceleration, therefore, must be something else than increase of velocity. It is known to be in part deflection and can all be thus explained; and if the first law of motion is universally valid it is thus explained. Therefore:

1. Acceleration is deflection.
2. The velocity of motion is constant.
3. The direction of motion is variable.
4. MOTION IS INHERENT IN MATTER AND IS NOT IMPOSED UPON IT FROM WITHOUT.

J. W. POWELL.

WASHINGTON, D. C.

BUDDHISM AND CHRISTIANITY.

EXPOSITION.

CHRISTIANITY, including Roman and Greek Catholics, the Protestants and all the smaller sects, may lay claim to about twenty-six per cent. of the inhabitants of the earth, and ranks, in number of adherents, as the second greatest religion. It is considerably surpassed by Buddhism which is calculated by Prof. Rhys Davids to count five hundred million adherents, or forty per cent. of all the inhabitants of the earth.[1] The next religions in order are Hinduism with thirteen, and Islam with twelve and one half per cent. In addition we have one half per cent. Jews, and eight per cent. of other creeds of less importance.

Now it is a strange fact that Buddhism and Christianity, constituting together sixty-six per cent., which is considerably more than one half of mankind, possess several most important features in common, and their agreement cannot be a product of mere chance. It is well known that many Christian missionaries, for instance, Huc and Gabet, the Jesuits,[2] were quite at a loss to account for so many

[1] For details see the statistical tables on pp. 4–5 of Rhys David's *Buddhism* published in the series of *Non-Christian Religious Systems*, London, 1890.

The objection has been made that the Chinese Buddhists are at the same time adherents of Confucius and Tâo and it is claimed that if the number of Buddhists were reduced to those who are true Buddhists, and nothing but Buddhists, Christianity could easily be proved to be numerically the first religion of the world. This may be true, but is this method of using statistics legitimate? Would it not in that case be fair to apply the same restriction to both sides? The number of Christians would shrink in no less degree if we counted the real Christians, or at least the confessed Christians only, which in the United States would reduce them to the churched people who are less than one-tenth of the entire population.

[2] Quoted in *The Monist*, Vol. IV, No. 3, p. 418.

striking coincidences, and Bishop Bigandet, the Apostolic Vicar of Ava and Pegu, writes:

"Most of the moral truths, prescribed by the Gospel, are to be met with in the Buddhistic scriptures. . . . In reading the particulars of the life of the last Buddha Gaudama, it is impossible not to feel reminded of many circumstances relating to our Saviour's life, such as it has been sketched out by the Evangelists."

The idea of a Buddhistic origin of Christianity has been suggested more than once; but it is incumbent upon us to state that some of the men who must be regarded as the most competent to judge this matter are either extremely reticent or scorn the suggestion as quite impossible. While it is true that Arthur Lillie and Rudolf Seydel, who have done most to make the theory popular, introduce many vague speculations, we cannot regard a refutation of some of their vagaries as sufficient to settle the subject. No argument has as yet been offered to dispose of the hypothesis, which possesses, to say the least, a great probability in its favor. It is our intention here to enumerate some of the most salient facts so as to show them in their full importance, in the hope that specialists will give us more light on the subject. We repeat the motto which Albrecht Weber inscribed upon the title-page of his *Indische Literaturgeschichte:*

"Nil desperari!
Auch hier wird es tagen."

The agreement of the ethical spirit of both religions, Buddhism and Christianity, appears the more striking from our being confronted with an obvious difference between their dogmatologies. Christians believe in God, soul, and immortality, while Buddhists aspire to reach Nirvâna. They have no such terms as God and soul. On the contrary, they reject the ideas of a personal Creator of the world and of an indissoluble soul-unit, an âtman, or ego-entity in man, and thus they are decried by Christians as atheists and deniers of the existence of the soul. Having explained in a previous article that Buddhism is not negative, that its Nirvâna is neither more nor less positive than the Christian heaven, and that Buddha only rejects the gratuitous assumption of a metaphysical soul-agent behind the soul, not the existence of the soul itself, we shall now review

the most obvious similarities and dissimilarities of Buddhism and Christianity; and we come to the conclusion that, *supposing no historical connexion exists between the two faiths, their agreement must be regarded as very remarkable;* for in that case we must recognise the fact, that *both Buddhists and Christians, facing the same problems of life, solve them in a similar spirit although using different modes of expression.* It would go far to prove that *the basic truths of both religions are deeply rooted in the nature of things* and cannot be supposed (as is the theory of supernaturalistic dualism) to stand in contradiction to the cosmic order of the world or to the laws according to which social institutions develop.

BUDDHA AND CHRIST.

Let us briefly recapitulate the similarities between Buddhism and Christianity.

According to the sacred legends, Buddha, like Christ, was of royal, not of priestly, lineage; and his life while he was still a babe was jeopardised on account of the transcendent glory of his future. The chapter entitled "The Fear of Bimbisâra,"[1] contains a parallel to the story of Herod's massacre of the infants in Bethlehem. The state ministers of Maghada make inquiry if there be any one capable of depriving the king of his regal power. Two of their messengers find among the Shâkyas an infant newly born, the first begotten of his mother, who would either become a universal monarch or a Buddha. On their return they exhort the king "to raise an army and destroy the child, lest he should overturn the empire of the king." But Bimbisâra (unlike Herod of the New Testament) refuses to commit the crime.

The same story is told of Krishna, who is persecuted as an infant by the tyrant of Madura. The latter, unable to find the boy, ordains the massacre of all the children of male sex born during the night of Krishna's birth.

Both Buddha and Christ led a life of poverty. Both wandered about without a home, without a family, without property. They

[1] Beal, *Romantic History of Buddha*, pp. 103–104.

lived like the lilies of the field, and preached to all people, to rich and poor alike, without distinction of class, the gospel of the deliverance from evil.

Both Buddha and Christ, according to the canonical books of their respective religions were hailed soon after their birth, as the saviours of the world, by celestial spirits, by a religious prophet, and by sages. Dêvas, like the angels in the Christian Gospel, sing hymns. Asita is the Christian Simeon; the Nâga-râjas are the Magi. Aged women are also mentioned, who, like Anna, bless the baby.[1]

We read in the Tibetan *Life of Buddha*[2]:

"It was the habit of the Çakyas to make all new-born children bow down at the feet of a statue of the yaksha Çakyavardana; so the king took the young child to the temple, but the yaksha bowed down at his feet. . . . When the king saw the yaksha bow at the child's feet he exclaimed, 'He is the god of gods!' and the child was therefore called Devatideva."

The apocryphal Gospel of Pseudo-Matthew contains a similar passage[3]:

"Now it came to pass that when the most blessed Mary, with her little Infant, had entered the temple, all the idols were prostrate on the earth, so that they all lay upon their faces wholly shattered and broken."

Both Buddha and Christ excelled their teachers. Both were greeted by a woman who was delighted with their personal beauty. The "noble virgin Kisâ Gotamî" bursts forth into the song:

"Blessed indeed is the mother,
Blessed indeed is the father,
Blessed indeed is the wife,
Who owns this lord so glorious."—*Birth Stories*, p. 80.

This reminds one of the incident mentioned in Luke xi, 27:

[1] See Ashvaghosha's *Life of Buddha*, verses 39-40.—*Sacred Books of the East*, (afterwards cited as S. B. of E.) vol. xix, pp. 1–20.

[2] *The Life of Buddha and the Early History of His Order, Derived from Tibetan Works in the Bkah-Hgyur and Bstan-Hgyur*, translated by W. Woodville Rockhill, p. 17. See also S. Beal, *Romantic History of Buddha*, p. 52.

[3] *The Apocryphal Gospels*, tr. by B. Harris Cowper, 4th ed. p. 63. See also *The Arabic Gospel of the Infancy*, *ibid.*, p. 178.

"And it came to pass, as he spake these things, a certain woman of the company lifted up her voice, and said unto him, Blessed is the womb that bare thee, and the paps which thou hast sucked."

The word *Nibbuta*, i. e. "blessed, happy, peace," reminds Buddha of *Nibbuti*, i. e., *Nibbana*.[1] He says:

"By what can every heart attain to lasting happiness and peace?

"And to him whose mind was estranged from sin the answer came, 'When the fire of lust is gone out then peace is gained; when the fires of hatred and delusion are gone out, then peace is gained; when the troubles of mind, arising from pride, credulity, and all other sins, have ceased, then peace is gained!' Sweet is the lesson this singer makes me hear, for the Nirvâna of Peace is that which I have been trying to find out. This very day I will break away from household cares! I will renounce the world! I will follow only after the Nirvâna itself!"

In a similar spirit Christ replies (Luke xi, 28):

"Yea, rather blessed are they that hear the word of God, and keep it."

Both Buddha and Christ were tempted by the Evil One.[2]

Both Buddha and Christ confessed their mission to be the establishing on earth of a kingdom of righteousness;[3] they sent out their disciples to preach the gospel. Said Buddha:

"Go ye now, O Bhikkhus, and wander, for the gain of the many, for the welfare of the many, out of compassion for the world, for the good, for the gain, and for the welfare of gods and men. Let not two of you go the same way. Preach, O Bhikkhus, the doctrine which is glorious in the beginning, glorious in the middle, glorious in the end, in the spirit and in the letter; proclaim a consummate, perfect, and pure life of holiness. There are beings whose mental eyes are covered by scarcely any dust, but if the doctrine is not preached to them, they cannot attain salvation. They will understand the doctrine. And I will go also, O Bhikkhus, to Uruvelâ, to Senânînigama, in order to preach the doctrine."[4]

Both Buddha and Christ refused to find recognition by pandering to the superstitions of those who seek for signs;[5] Buddha posi-

---

[1] *Birth Stories*, p. 80, and Spence Hardy, *Manual*, p. 160.

[2] Compare Ashvagosha's *Life of Buddha*, chapter xiii, "Defeats of Mâra, S. B. of E., vol. xix, p. 147, with Luke iv, 2, Matth. iv, 1–7, Mark i, 13.

[3] See the *Dhamma-chakka-ppavattana-Sutta*,—viz., on "The Foundation of the Kingdom of Righteousness,"—S. B. of E., vol. xi, p. 146, and Bigandet, p. 125.

[4] See *Mahâvagga* i, ii, p. 112, S. B. E., vol. xiii; compare also Ashvaghosha's *Life of Buddha*, p. 183, with Mark iii, 14, and Luke ix, 2.

[5] See Luke xi, 16, and *passim*.

tively forbade miracles.[1] And yet to both innumerable miracles were attributed.

Of both we read that they walked on the water. The origin of the Buddhist legend can be traced to the allegorical expression of crossing the stream of worldliness (samsâra) and reaching the other side, which is the shore of celestial rest (Nirvâna). There is no such spiritual meaning in Christianity, or, if there was one, the metaphor has been obliterated.

At a marriage-feast both Buddha and Christ miraculously helped the host to entertain his guests. In Buddha's presence, as we are told in the story of the marriage-feast at Jambunada,[2] a small supply of food proves over and over sufficient for a great number of guests. The idea of turning water into wine, at the marriage at Cana,[3] is un-Buddhistic.

Both Buddha and Christ tried asceticism for a time, and carried their fasts to the extreme. We read:

"Each day eating one hemp grain, his bodily form shrunken and attenuated, seeking how to cross (the sea of) birth and death, exercising himself still deeper and advancing further." (Ashvaghosha's *Life of Buddha*, verse 1007.)

But both gave up these methods of gaining holiness by self-mortification for a middle way.[4] Both were in consequence of it suspected by former believers of flagging in religious zeal.[5]

Both Buddha and Christ were powerful preachers, fond of parables, and concentrating their teachings in pithy aphorisms, which were both impressive and easily remembered. Both were keen thinkers, and invincible in controversies, as a rule, bringing the debate to a climax by presenting a dilemma, and always pressing the moral application of their theories. Both exercised an extraordinary influence; they looked into the hearts of men and swayed their

---

[1] See W. W. Rockhill's *Life of Buddha*, pp. 68–69.

[2] *Fu Pen Hing Tsi King*, translated by Beal.

[3] John ii, 1, et seq.

[4] *Dhammapada*, verse 227; Chinese version of the *Dhammapada*, translated by Beal, p. 122.

[5] Compare Ashvaghosha's *Life of Buddha*, verses 1024, and 1222–1224, with Luke vii, 19, Matth. xi, 3.

minds through purity of motive and the authoritative earnestness of their personality. Both objected to the traditional method of clinging to the letter of religious belief which is satisfied with rituals and prayers, and both substituted for it the spirit of religious devotion and moral conduct.[1] Both loved to express their sentiments in paradoxes, such as, "By giving away we gain; by losing our soul we preserve it; by non-resistance we conquer." And both spoke in parables.[2] Many subjects of their parables are the same; as such we mention the sower[3] and the lost son;[4] the worldly fool who builds a large residence with store-rooms, but dies suddenly;[5] the comparison of good deeds to seeds sown on good and bad soil, according to the nature of the people, illustrating the truth that in bad people the passions choke the growth of merit. Buddha calls the Brahmans, and Christ the Pharisees, "blind leaders of the blind."[6]

Both Buddha and Christ show an unexpected graciousness toward a woman sinner;[7] and a Buddhist disciple had an encounter with a woman at a well analogous to that of Christ in Samaria.[8]

Both Buddha and Christ were, like Krishna,[9] transfigured shortly before death,[10] and above all, both inculcated the utter extinction of desire, lust, and hate in their very germ, so as to forbid

---

[1] As an instance of Buddha's method of spiritualising religious rites see the *Sigâlovâda Sutta* in *Sept Suttas Pâlis*, by M. P. Grimblot (Paris), p. 311.

[2] "'Powerful in making comparisons,' is one of Buddha's characteristic names." —Beal, foot-note to Ashvaghosha's *Life of Buddha*, verse 1915, S. B. of E., xix, p. 280.

[3] *Sutta Nipâta*, p. 11–15, S. B. of E., Second Part.

[4] *Saddharmapundarika* iv.

[5] Beal, *Translation of Chinese Dhammapada*, p. 77.

[6] Compare Matthew xv, 14, with *Tevigga Sutta*, i, 15, and *Lalita Vistara*, p. 179. See also Beal's *Romantic History of Buddha*, p. 106, where the phrase occurs, "Like a blind man who undertakes to lead the blind."

[7] See the story of Ambapâli in *Mahâvagga* vi, 30. The courtesan Ambapâli is called "Lady Amra" in Ashvagosha's *Life of Buddha*, p. 255–256.

[8] Compare John v, et seq., with Burnouf's *Introduction*, p. 205.

[9] The transfiguration of Krishna serves the purpose of strengthening the faith of his followers in the presence of danger. See Jacolliot, *The Bible in India*, p. 306.

[10] Compare Matthew xvii, 2, and Mark ix, 2, with *Mahâparinibbâna Sutta* iv, 47, 52.

all assertion of self, even the resistance to evil, and both demand the practice of love of enemies.[1]

SIMILARITIES IN TEACHING.

There are, in addition, numerous coincidences in their utterances, so that many of the sayings of Christ and Buddha appear like two different reports of the same speech. Thus we read in the *Sutra of Forty-two Sections*, 10:

"It is difficult for the rich and noble to be religious."

And Christ said (Matthew xix, 24, Mark x, 25, and Luke xviii, 25):

"And again I say unto you, It is easier for a camel to go through the eye of a needle, than for a rich man to enter into the kingdom of God."

The Dharma is frequently compared to living waters, as in John iv, 14, vii, 38, Rev. xxi, 6, xxii, 17, and to a pearl, or a jewel, as in Matthew xiii, 45–46, while Nirvâna is described as a city of peace and an island of jewels,[2] similarly as the new Jerusalem.

Yashas, the noble youth of Benares,[3] visits Buddha in the night, like Nicodemus;[4] but if Nicodemus had been a Brahman, he would not have been mystified by Christ's proposition of the necessity of a spiritual rebirth; he would have understood the expression. The term "twice born" or "reborn" is still among Buddhists a title of honor given to priests and other men of distinction.

The coming of the Tathâgata (Buddha) is likened to the wind. We read in *The Questions of King Milinda*, page 148:

"As the great and mighty wind which blew, even so, great king, has the Blessed One blown over the ten thousand world-systems with the wind of his love, so cool, so sweet, so calm, so delicate."

How similar, although less clear, is the passage in John iii, 8:

"The wind bloweth where it listeth, and thou hearest the sound thereof, but

---

[1] Compare *Dhammapada*, 5, "Hatred ceases by love," and many other passages, with Matthew v, 44, "Love your enemies."

[2] See *Dhammapada*, p. 181.

[3] Ashvaghosha's *Life of Buddha*, p. 180, *Mahâvagga*, i, 7.

[4] See John iii, 2.

canst not tell whence it cometh, and whither it goeth: so is every one that is born of the Spirit."

The Dharma (viz., religion) is said to be like the salt of the ocean, one in taste throughout, which reminds us of Jesus saying that his disciples are the salt of the earth;[1] and the exhortation is made by both Buddha and Christ to lay up treasures that are incorruptible and inaccessible to thieves.[2]

Giving is praised in preference to receiving. In Ashvaghosha's *Life of Buddha*, 1516–1517, we read:

"Giving away our food, we get more strength; giving away our clothes, we get more beauty," etc. (S. B. of E., p. 215.)

In *The Questions of King Milinda* we find among the discussions concerning apparent contradictions explained by Nagasêma, that "the Dharma of the Tathâgata shines forth when displayed" (p. 264), which is contrasted with the injunction, "Do not let the Dharma . . . . fall into the hands of those unversed with it" (page 266). Both passages find their parallels in the Christian Gospel, the former in Matthew v, 16, "Let your light shine before men," and the latter in Matthew vii, 6, "Do not cast your pearls before swine."

Buddha says (in the *Sutra of Forty-two Sections*, 28) "Guard against looking on a woman," and (in Buddhaghosha's *Parables*, p. 153) he comments upon the law "commit no adultery," that it "is broken by even looking at the wife of another with a lustful mind." Christ expresses the same idea in almost the same words, saying: "Whosoever looketh on a woman to lust after her, has committed adultery with her already in his heart." (Matthew v, 28.)

The sentence, "If thy right eye offend thee pluck it out," (Matthew v, 29), finds a parallel in the words:

"Better far with red-hot iron pins bore out both your eyes, than encourage in yourself lustful thoughts." (Ashvaghosha's *Life of Buddha*, 1762–1763.)

---

[1] *Questions of King Milinda*, iii, 7, 15, and *Chullavagga* ix, 1, 4, which compare with Matthew v, 13.

[2] Compare *Nidhikandasutta*, the treasure chapter, where we read of "A treasure that no wrong of others and no thief can steal," with Matthew vi, 20.

"The armor of God" is described by St. Paul (Eph. vi, 13–17):

"Wherefore, take unto you the whole armor of God, that ye may be able to withstand in the evil day, and having done all, to stand.

"Stand, therefore, have your loins girt about with truth, and have on the breastplate of righteousness;

"And your feet shod with the preparation of the gospel of peace;

"Above all, taking the shield of faith, wherewith ye shall be able to quench all the fiery darts of the wicked.

"And take the helmet of salvation, and the sword of the Spirit, which is the word of God."

This reminds us of Ashvaghosha's *Life of Buddha*, 1761–1762:

"Take, then, the bow of earnest perseverance, and the sharp arrow-points of wisdom.

"Cover your head with the helmet of right thought, and fight with fixed resolve against the five desires."

In the *Lalita Vistara* (page 122) we read of the "World" that "it is like a city of sand. Its foundations cannot endure," which reminds us of Matthew vii, 26.

Matthew xxiv, 35: "My words shall not pass away," finds a parallel in *Buddhist Birth Stories*, p. 18: "The word of the glorious Buddhas is sure and everlasting."

Both Buddha and Christ point out to their adherents the good example of worldly people. Buddha says, when rebuking his disciples for improper behavior:

"Even the laymen, O bhikkhus . . . . will be respectful, affectionate, hospitable to their teachers. Do you, therefore, O bhikkhus, so let your light shine forth that you having left the world . . . . may be respectful, affectionate, hospitable to your teachers," etc. (*Mahâvagga* V, 4, 2, xvii, p. 18.)

And Christ says:

"If ye love them which love you, what reward have ye? Do not even the publicans the same? And if ye salute your brethren only, what do ye more than others? Do not even the publicans so?" (Matth. v, 46–47.)

Christ complains, in Matth. xi, 16–19, of the childish nature of the people whom no one can satisfy, neither John the Baptist who did not eat and drink nor the Son of Man who did eat and drink. In the same spirit Buddha says:

"They blame the man of many words, they blame the patient and quiet man, they also blame the man who seeks the happy medium." (See Beal's *Translation of the Chinese Dhammapada*, sect. xxv, p. 122. Compare *Pâli Dhammapada*, v. 227).

It is a curious coincidence that Christ, when speaking of the signs of the coming of the Son of Man, mentions "the fig tree's putting forth leaves" (Matth. xxiv, 32), while we read in the *Saddharmapundarîka*, ii, 134–136, S. B. of E., p. 58:

"At certain times and at certain places, somehow do leaders appear in the world . . . . just as the blossom of the glomerous fig-tree is rare, all so wonderful, and far more wonderful is the law I proclaim."

As the coming of the Son of Man, so his parting from life is expressed in words which present a certain similarity to Buddhistic passages. Christ says:

"Ye shall not see me" (St. John xvi, 16),

and again (Matth. xxiv, 23.)

"If any man shall say unto you, Lo, here is Christ, or there, believe it not."

The *Brahmajâla Sutta* (translated by Gogerly in *Sept Suttas Pâlis*, p. 59) although in a different sense also speaks of Buddha that he shall not be seen again. We read:

"That which binds the teacher to existence is cut off, but his body still remains. While his body still remains he will be seen by gods and man, but after the termination of life, upon the dissolution of the body, neither gods nor men will see him." (P. iii.)

THE MURDER OF PARENTS.

Remarkable as these parallels are, some of which are apparently incidental, some striking, some simply curious, the list is by no means exhausted.[1] Let me now add a passage in which the Buddhist version may be hoped to throw light upon the Christian narrative.

[1] Rudolf Seydel calls attention to a curious similarity of sound between important names. such as Mâyâ and Maria, Ânanda and Johannes, Sariputra and Peter, Devadatta, and Judas, each two of these characters, strange to say, being representative of the very same type and playing the same parts, those in Buddha's, these in Christ's life. But we have to add that the names Miryam, and Simeon Kephas, the Hebrew originals of Maria and Peter, resemble their Buddhistic counterparts very little and exhibit a remarkable instance of an incidental resemblance warning us not to take even striking coincidences as evidences of appropriation.

Christ's words in Matth. x, 21, "The children shall rise up against their parents and cause them to be put to death," have startled Christians in no less degree than an analogous passage in the Buddhist canon has the Buddhists. We read in the *Dhammapada*, verse 295 :

"A true Brahman goes scatheless, though he have killed father and mother and two holy kings and an eminent man besides."

Says the translator in the footnote on page 71 :

"D'Alois following the commentary explains mother as lust, father as pride, the two valiant kings as heretical systems, etc."

And Beal quotes in the Introduction to his *Translation of the Chinese Dhammapada* the following Buddhistic comment :

"Is not love (*Tanhâ*) which covets pleasure more and more, and so produces 'birth'—is not this the mother (*mâtâ*) of all? And is not 'ignorance' (*avidyâ*) the father (*pitâ*) of all? To destroy these two, then, is to slay father and mother. And again, to cut off and destroy those ten '*kleshas*' (Ch. *shi*) which like the rat or the secret poison, work invisibly, and to get rid of all the consequences of these faults (i. e., to destroy all material associations), this is to wound a Rahat. And to cause offence and overthrow a church or assembly, what is this but to separate entirely the connexion of the five *skandhas*? ('five *aggregates*,' which is the same word as that used above for the church). And again to draw the blood of a Buddha, what is this but to wound and get rid of the seven-fold body by the three methods of escape. . . . And in order to explain and enforce this more fully, the World-honored One added the following stanzas :

Lust, or carnal desire, this is the mother,
'Ignorance,' this is the father,
The highest point of knowledge, this is Buddha,
All the 'kleshas' these are the Rahats.
The five skandhas, these are the priests,
To commit the five unpardonable sins
Is to destroy these five
And yet not suffer pains of hell."

Christ's startling prediction that "the children will rise against their parents and cause them to be put to death" bears an obvious likeness to these Buddhistic passages and will, on the supposition of an historical connexion between both religions, find, if considered in the light of the above quotation, a natural explanation.

THE DOCTRINE OF NON-RESISTANCE.

In pushing their doctrine of kindness and love of enemies to the utmost extreme, both Buddha and Christ seem to have had but little regard for the ethics of struggle. We purposely say "seem," for the doctrine of non-resistance is one of many paradoxes which admit of a perfectly satisfactory explanation; it has been interpreted by orthodox Christian theologians and also by Buddhists to mean that a man's disposition of heart must be such that he does not defend his right because it is *his*, but because it is *right*; that selfishness and personal vanity must not be our motives of action; and that a man must be willing to give up, if need be, not only what is taken from him, but other things in addition. Thus we are told by Christian exegetists, that Christ does not demand of us to give up the mantle to him who robs us of our coat, for Christ himself defended his right when unjustly beaten. Christ himself carried on a bitter warfare against those whom he called hypocrites, and generations of vipers. He showed the belligerent spirit of his zeal when he cast out those who bartered in the temple and held pigeons for sale, which act was probably an emphatic protest against bloody sacrifices, so extremely offensive to the Essene brotherhood. And Buddha, too, with all his gentleness, was himself a powerful, although always kind-hearted, controversialist; and his disciples are frequently compared to warriors who with spiritual weapons had unflaggingly and zealously to struggle for the truth.

THE SANGHA AND THE CHURCH.

There are also striking resemblances in the development of the Sangha, or Buddhist brotherhood, and the Church. Universality is a marked feature of both religions. Thus Buddhism, as well as Christianity, is possessed of a missionary spirit; anxious to let everybody partake of the blessing of their religion, they sent out apostles to all known countries of the earth. Councils were held to settle disputes as to the right doctrine. A sacred literature originated first of the Master's sayings, with incidental mentionings of

the occasions on which they were uttered; and later hagiographers undertook to tell the whole story of his life. There is an increasing tendency perceptible in the development of both Buddhistic and Christian thought, of more and more exaggerating the marvellous and of adding legendary elements. The sober spirit of Western civilisation, however, kept these tendencies in check by rejecting the apocryphal books, which also bear in several of their narratives a striking resemblance to Buddhistic tales.

There were monks in Buddhism long before Christianity existed; and Buddhist monks wear rough garments, live under the same, or almost the same, restrictions, have tonsures, and employ rosaries. They live as hermits or in cloisters, and the clergy of Tibet possess a hierarchy with institutions which are quite analogous to that of the Roman Catholic Church. They have processions, they baptise,[1] they sprinkle with holy water, and use the confessional.

There are analogies even of sects and heresies. The Doketistic heresy believed that Christ, because he was God, could have suffered no pain; his whole being was uncontaminated with material existence, and his body was mere appearance, a sham—hence the name of the sect from δοκεῖν, to seem. This view is represented in the apocryphal "Gospel according to St. Peter," in which we read (verse 10): "And they brought two malefactors and crucified the Lord between them; but he kept silence, as *feeling* no pain." Doketism is also one of the Buddhist heresies, as may be learned from a passage quoted from the *Fo-pan-ni-pan-king*, an expanded rendering of the *Parinirvâna-Sutra*, translated into Chinese by Dharmaraksha (*Sacred Books of the East*, Vol. XIX, p. 365, et seqq). The Tathâgata says to Chunda, the smith:

"To those who as yet have no knowledge of the nature of Buddha, to these the body of Tathâgata seems capable of suffering, liable to want (but to others it is not

[1] It is difficult to say whether or not baptism was established among the early Buddhists; if so, it is probable that the ceremony is older than Buddhism. We find bathing in the Ganges mentioned as a religious rite in Ashvagosha's *Life of Buddha*, verses 164–165. But no further explanation is given concerning it. Was it an ablution, or did it symbolise the crossing of the stream of samsâra? It is remarkable that St. Paul (I. Cor. iv, 1–4) says that the crossing of the Red Sea was the baptism of the children of Israel.

so); at the time when Bodhisattva received the offering of food and drink (he was supposed to have eaten the food). . . . so now having received your offering, he will preach the law. But still, as in the former case he ate not, so neither does he eat now."—Transl. by Samuel Beal, *l. c.*, p. 367.

There are two incidents which link Buddhism and Christianity together, in a quite peculiar way. On the one hand, Buddha has been received among the saints under the name of St. Josaphat,[1] so that in this respect the followers of Buddha must appear to Christians as a kind of Christian sect, however incomplete their dogmatic Christianity may be. On the other hand, Buddha prophesied that the next Buddha after him would be Maitrêya, the Buddha of kindness, and without doing any violence to Buddha's words, this prophecy may be said to be fulfilled in Jesus of Nazareth. Thus the Christians may be said to be Buddhists that worship Maitrêya under the name of Christ.

THE MAIN DIFFERENCE.

The similarities of Christianity and Buddhism are the more remarkable as among the dissimilarities there is one which exhibits an almost irreconcilable contrast. All those members of the various Christian denominations who call themselves its orthodox representatives, regard the belief in a personal God (an Îshvara) as the foundation of their religious faith. No wonder that they characterise Buddha's religion as atheism, denouncing it as unsatisfactory, or even nihilistic, and vigorously repudiate any kinship which might be supposed to obtain between both creeds.

The God-idea, representing the ultimate authority of conduct, is so fundamental in Christianity that Christians cannot think of any atheistic religion; they actually identify religion with belief in

[1] Josaphat is a corruption of Bodhisattva. For a detailed account of the Barlaam and Josaphat literature see Rhys Davids's *Buddhist Birth Stories*, pp. xxxvi, et seq. Rhys Davids says on p. xli: "It was Prof. Max Müller, who has done so much to infuse the glow of life into the dry bones of Oriental scholarship, who first pointed out the strange fact—almost incredible, were it not for the completeness of the proof—that Gotama, the Buddha, under the name of St. Josaphat, is now officially recognised and worshipped throughout the whole of Catholic Christendom as a Christian saint!"

God; and, indeed, we confess that it is remarkable how Buddhists can dispense at all with the God-idea.

We grant that no religion can exist without a belief in the existence of an ultimate authority of conduct; but in this sense Buddhism, too, teaches a belief in God. The Abhidharma, or Buddhist philosophy, distinctly rejects the idea of a creation by an Îshvara, i. e., a personal Creator; but it recognises that all deeds, be they good or evil, will bear fruit according to their nature, and they teach that this law, which is ultimately identical with the law of cause and effect, is an irreversible reality; that there are no exceptions or deviations from it. Thus, law takes to some extent the place of the God-idea, and Buddhists gain a personal attitude to it, similarly as Christians do when speaking of God, in quite a peculiar way. The doctrine of the Trikâya, or the three bodies, teaches that Buddha has three personalities; the first one is the Dharma-Kâya, or the body of the law: it corresponds to the Holy Ghost in the Christian dogmatology. The second personality is the Nirmâna-Kâya, or the body of transformations; it is transient in its various forms, and its most important and latest appearance has been Gautama Siddhârtha. This corresponds to the second person of the Christian Trinity, to God the Son, or Christ. But there is this difference: that the Nirmâna Kâya appeared before Gautama Siddhârtha in many other incarnations and will reappear in this and other worlds again; for every one who has attained to enlightenment and reached the ideal of perfection is a Tathâgata, a Buddha, a preacher of moral truth. It is in agreement with this conception that Philo speaks of Moses as a former incarnation of the Logos. The third personality of Buddha is called Sambhôga-Kâya, or the body of bliss. It is the Christian idea of God the Father. Buddha in his capacity as Sambhôga-Kâya is described as eternal, omnipresent, and omnipotent. He is the life of all that lives and the reality of all that exists. Thus he is the All in All, in whom we live and move and have our being.

Buddhistic atheism, apparently, is not wholly unlike Christian theism.

Christianity possesses in the idea, and, indeed, in the very word

Fig. 1.

Fig. 2.

Fig. 3.

"God," representing the authority of moral conduct in a most forcible manner, a symbol of invaluable importance; it is an advantage which has contributed not a little to make Christianity so powerful and popular, so impressive and effective as it has proved itself to be. In this little word "God," much has been condensed, and it contains an unfathomable depth of religious comfort.

No serious thinker who has ever grappled with the problem of the God-idea can have any doubt that the conception of God as an individual being is a mere allegory symbolising a great truth which it is difficult to explain to untrained minds in purely scientific terms. There is a disadvantage and there is also an advantage in mythological terms. Let us here as everywhere learn from various methods of presenting a truth. Let us prove all and hold fast that which is good.

BUDDHISTIC ART.

The spirit of Buddhism also exhibits a palpable affinity with Christian conceptions in its art productions, which, we have every reason to believe, originated uninfluenced by either the technique or the taste of the Western civilisation. The difference between Western and Eastern taste is as strongly marked in religious art as in the other walks of life. Nevertheless, there is an unmistakable coincidence of aspiration, which will strike any one who visits the Buddhistic departments of the Musée Guimet at Paris, or glances over the *Illustrated Guide* of its collections. We reproduce here a few pictures which seem to us especially instructive, because they express sentiments which are not foreign to the student of Christian art.

1. Mi-rô-Kou, or Maitrêya, the Buddha to come, of gilded wood (Sixteenth Century), seated upon a lotus in an attitude as if ready to rise and proclaim to the world the Gospel of the Good Law. The halo round his head and the divinely glorious attitude of his whole person remind us of Roman Catholic conceptions of Christ, such as can be found in abundance in all Catholic countries, especially in Southern Europe and in the Spanish colonies of America.

2. Amida (Buddha Amitâbha), also of gilded wood (Fifteenth

Century), stands upon the lotus in the attitude of a teacher. In contrast to the statue of Mi-rô-Kou it emphasises the human in Buddha and reminds us of the Protestant conception of Christ, which found its noblest representation in Thorwaldsen's famous statue.

3. Sam-bô, or the Buddhistic trinity, again representing Roman Catholic taste, shows the three jewels, the Buddha, the Dharma, and the Sangha. The Dharma (in one sense the Christian logos, in another the Holy Ghost) being most appropriately represented by written words, nor is it impossible that its higher position may indicate a certain superiority over the Buddha and the Sangha. For the Buddha is the incarnation and the Sangha the continued proclamation of the Dharma.

4. Kouan-yin, a peculiar conception of Buddha (made of porcelain), represents Buddha in one of his female incarnations as the goddess of charity and motherly love. The resemblance to Roman Catholic representations of Mary, the mother of Christ, is obvious, and the coincidence loses none of its force when we consider that the mythological conception of Kouan-yin is radically different from that of Mary. Buddha is conceived not as the object of motherly love, not as the infant, but as Love itself. The statues on both sides of the chair are Hoang-tchen-saï, the disciple of Kouan-yin, and Loung-nou, the servant of Kouan-yin ; the former in an attitude of worship, the latter holding in his hands a luminous pearl. The necklace of Kouan-yin contains an ornament in the shape of a cross of the Renaissance.

5. Kouan-on, the Buddha of Charity, of gilt wood (Twelfth Century), an art production of the Tendai sect, exhibits what appears to us a transition to the conception of Buddha in the form of Kouan-yin. Buddha's attitude and the grace of his appearance is almost womanly, and might serve as a statue of the Virgin.

6. The Devil as a Buddhistic monk, carved wood of the Seventeenth Century, finds many parallel productions on the pinnacles of Gothic cathedrals. There is little probability that the Japanese artist who, with great ingenuity and humor, sculptured this admirable statue, ever heard of Rabelais, whose verse from Book IV,

Fig. 4.

Fig. 5.

Fig. 6.

chapter xxiv, has become an English proverb, which, according to Bartlett's *Familiar Quotations*, page 772, reads as follows :

> "The Devil was sick, the Devil a monk would be :
> The Devil was well, the devil a monk was he."

There is not only an obvious similarity in the religious ideas and objects of devotion, but even in religious satire, which cannot be explained by imitation, but must have originated independently in Buddhism as in Christianity.

THE CONNEXIONS BETWEEN THE EAST AND WEST.

The question whether Christianity and Buddhism have a common origin is perhaps less important than it appears, yet there attaches to it a peculiar interest because there is a numerically very strong section of Christians who would not allow that the noble ethical maxims of Jesus of Nazareth could have developed according to the laws of nature in the normal progress of evolution. There is certainly very little probability of a borrowing on the part of Buddhism as it is in all its essential features considerably older than Christianity. Buddha lived in the fifth century before Christ. The Buddhistic canon was settled at the time of the second council which took place about 250 B.C., and Ashoka's rock inscriptions which contain the gist of Buddha's doctrine and testify to its established existence date from the same period. This excludes at once the supposition that Buddhism is indebted to Christianity for its lofty morality and the purity of its ideals.

We must add that it remains not impossible (although not probable) that Buddhism, as it developed in its later phases in the North, has received from Christianity some modes of worship for which there would have been no place in the older Buddhism. Thus Prof. Samuel Beal believes that Christian ideas and forms of worship must have been imported into Northern India as early as 50 A.D. He considers it as highly probable that King Gondoforus of the Legenda Aurea is identical with Gondophares, the founder of the Scythian dynasty in Seistan Vandahâr and Sindh, coins of whose reign are mentioned by General Cunningham. (*Arch. Survey of*

Ind., II, p. 59.) Professor Beal trusts that the old legend of St. Thomas's visit to India is confirmed; he does not consider, however, the possibility, which is not improbable, that the legend of St. Thomas may, like the St. Josaphat story, be a Christianised Buddhist legend. We waive the question and confine ourselves to stating that the evidences which Professor Beal introduces to prove the possibility of a Christian influence upon later Buddhism go still farther to establish the possibility of a Buddhistic influence upon Judea before the time of Christ's appearance. Professor Beal says (p. 133–134):

"The Parthian prince, Pacorus, was, as Josephus tells us, in possession of Syria and at Jerusalem. . . . Then again, the marriage of Chandragupta with a daughter of Seleucus, and the apparent knowledge possessed by the grandson of Chandragupta, the great Asoka, with the Greek King Antiochus, and his embassy to four other Greek kings,—all this shows that there must have been some connexion between India and the Western world, from the time of the establishment of Greek influence in the valley of the Oxus."

There were plenty of channels through which Buddhist doctrines could reach Palestine.

Speaking of the similarity between the Buddhist story of the wise judge and the account of Solomon's judgment, as told in the Book of Kings, Prof. Rhys Davids mentions the commercial relations that obtained in those early days between Judea and India. He says (*Buddhist Birth Stories*, pp. xlvi–xlvii):

"The land of Ophir was probably in India. The Hebrew names of the apes and peacocks said to have been brought thence by Solomon's coasting-vessels are merely corruptions of Indian names. . . . But any intercourse between Solomon's servants and the people of Ophir must, from the difference of language, have been of the most meagre extent; and we may safely conclude that it was not the means of the migration of our tale.

"Though the intercourse by sea was not continued after Solomon's time, gold of Ophir, ivory, jade, and Eastern gems still found their way to the West; and it would be an interesting task for an Assyrian or Hebrew scholar to trace the evidence of this ancient overland route in other ways."

In order to prove the possibility of an exchange of thought between India and Judea, it is not even necessary to fall back upon these old commercial relations which are difficult to trace, for we know for sure that since Alexander's time the connexions between

the East and the West in general, and especially between Buddhist countries and Judea, were quite intimate. Ashoka's rock inscriptions alone are sufficient to prove that official legations had been dispatched from India to the most important neighboring countries and to Western Asia for the sole purpose of making a strong propaganda for Buddha's religion and the Buddhistic principles of universal kindness and compassion for the suffering. The second edict mentions a legation to King Antiochus for mere humanitarian purposes. It reads as follows:

"Everywhere in the kingdom of the king Priyadarshin,[1] beloved of the gods, and (among those) who (are) his neighbors, as the Codas, the Pandyas, the prince of the Satiyas, the prince of the Karalas Tâmraparnî, the Yavanas[2] king Antiochus and (among the) others who (are) the vassal kings of Antiochus—everywhere the king Priyadarshin, beloved of the gods, founded two (kinds of) hospitals—hospitals for men and hospitals for animals. Wherever there were no healing herbs to be found, whether herbs fit for men or herbs fit for animals, to all such places and in all such places, he issued orders to have such herbs brought and planted. Also where there were no healing roots and fruits he issued orders to have (them) brought and planted. And along the roads he had trees planted and wells dug for the use of man and beast."

The thirteenth edict speaks directly of a missionary legation for spreading Buddha's religion. The first part of the inscription is mutilated. The German translator, Professor Bühler, says that from the few correctly read words of a version of the same edict preserved near Shâhbâzgarhî, and from the fragment of the Girnâr inscription, the thought of the missing lines can be restored. Having expressed remorse at the atrocities committed before his conversion in Kaliriga, the king states that it is his intention from now on to make no more conquests by the sword, but is determined to take from his free neighbors everything that can possibly be endured. He adds that even the wild tribes in the forest ought to be participants of this kindness, and concludes with the remark that he has no other desire than to treat all beings with indulgence, justice, and clemency. The part still extant reads:

---

[1] This is the customary appellation of Ashoka.

[2] The Yavanas are the Greeks.

"(The beloved of the gods wishes) . . . . for all creatures . . . . forbearance justice, and clemency! But the following is judged of the greatest consequence by the beloved of the gods, namely, conquest by the law (Dhaṃmavijaye). This conquest is made by the beloved of the gods as well here (in his own kingdom) as among all his neighbors. For at a distance of six hundred Yojanas lives the (king) of the Yavanas (Greeks), called Aṃtiyoga (Antiochus) his neighbor, and beyond him are four, 4, kings, one named Tulamaya (Ptolemæus), one called Aikyashudala (Alexander); (further), towards the South the Codas (Colas) and the Paṃdiyas (Pândyas) as far as Tambapaṃni (Ceylon), likewise the Hida king among the Vishas (Bais), and Vajis (Vrijis), the Yavanas (the Greeks) and the Kambojas (Kâbulîs), among the Nâbha tribes of Nabhaka, among the Bhojas and Pitinikas, among Andhras and Piladas (Puliadas)—everywhere is the doctrine of the law of the beloved of the gods followed. Even those to whom the envoys of the beloved of the gods do not go, follow the law, as soon as they have heard the comments issued by the beloved of the gods according to the law, his sermon of the law, and they shall follow it in the time to come. The conquest which by this means is everywhere accomplished fills (me) with a feeling of joy. Firmly founded is (this) joy, the joy at the conquest by the law. But (this) joy is in sooth merely something slight. The beloved of the gods holds that only of worth which has reference to the Beyond. But this religious edict is written for the following purpose. To what purpose? That my sons and grandsons (to the end of time) shall deem no other kind of conquest desirable, that if a conquest by weapons should be absolutely necessary they should exercise mercy and clemency, and that they shall only regard conquest by the law as real conquest. Such a (conquest) brings salvation here to you. But all (its joy) is the joy of effort. This, too, brings salvation here and beyond."[1]

Thus there cannot be the slightest doubt that Buddhist missionaries were sent to Western Asia in the third century before the Christian era and must have made attempts to preach Buddhism.

Concerning the importation of Buddhist tales, Professor Rhys Davids says (p. xliii):

"We only know that at the end of the fourth, and still more in the third, century before Christ there was constant travelling to and fro between the Greek dominions in the East and the adjoining parts of India, which were then Buddhist, and that the birth stories were already popular among the Buddhists in Afghanistan, where the Greeks remained for a long time."

Shall we assume with Rhys Davids that a great number of Jataka tales, such as the legend of the Kisâ-Gotamî,[2] the story of the ass in

[1] Translated from the *Zeitsch. für Morgenl. Gesellschaft*, Vol. XIV, pp. 135, 136.

[2] See Jacob H. Thiessen, *Die Legende von Kisâ-Gotamî*, Breslau, 1880.

the lion's skin, the jackal and the crow, and other prototypes of the so-called Æsopean fables, found their way to Greece, there to reappear in Greek literature, while the main ideas of Buddha's religion remained utterly unknown in the West? No Western traveller, we are bid to believe, ever heard of them in the East, and no Eastern traveller ever mentioned them in the West. And yet we know that the Buddhists were burning with zeal for propagating their religion, and the Sangha sent out missionaries into all quarters of the world. It would be strange if Buddhist missionaries had gone to all neighboring countries except to Palestine, and that all kinds of Buddhist stories and wise saws were translated into other tongues, but not the essential doctrines of their sacred literature.

POSSIBLE BUDDHISTIC ORIGIN.

The probability that an influx of Buddhistic doctrines took place is very strong; nevertheless we do not press the theory that Christianity was influenced by Buddha's religion, but regard it as a mere hypothesis. Here is a proposition of how matters might have been:

It is certain that Buddhist missionaries, had they come to Palestine, would not have attacked the religion of the country, but would, in accordance with their traditional policy, have adapted themselves as much as possible to the current ideas of the people. They would have preached the gospel of Buddha, and would have tried to proclaim their message in the very terms of the Jewish creed. The soil was prepared for them by Isaiah and other prophets who objected to bloody sacrifices. It would be quite in accord with their methods pursued in other countries to adopt the Messiah idea, and to embody the Jewish notions into their faith. The Buddhist missionaries did not cling to Gautama Siddhârtha; they would always be as ready to preach the Buddha of the past as the Buddha to come. Since Buddha himself had proclaimed the coming of Maitrêya, the Buddha of Kindness, must it not have appeared possible to Buddhists living in Judæa and observing the religious earnestness of the Jews, that Maitrêya was to rise among the Jews? This would explain

not only the origin of the Essene movement, which otherwise appears very obscure, but also the change of the worldly idea of a Jewish Messiah into the conception of a spiritual saviour of the whole human race from sin. The first symptoms of this change are found already in the Jewish Apocrypha, especially the book of Esdras, in which "the Son of David" begins to be called "the Son of Man," an expression that was adopted by Jesus. The great mass of the Jews of the time of Jesus still expected a Messiah who would be like Judas Maccabæus, a warrior and a worldly king, a redeemer from foreign oppression, yet the Essenes and the disciples of John regarded the various dignities which tradition attributed to the Messiah, as mere similes. In their idea the Messiah would be an ascetic hermit and a wandering preacher, more like Buddha than like Herod, for his kingdom was not of this world; he was the Dharmarâja, the king of truth.

As the Brahman god, Brahma, continued to play an important part in the Buddhist mythology, so we ought to expect that Buddhist missionaries would not have attempted to deny the existence of Jehovah. Yet, knowing the sternness of Jewish monotheism, we can understand that the Jewish God could not take a place inferior to Buddha; and as Buddha on the other hand was superior to all gods, both God and Buddha could only be identified, so that Christ could say: "I and the Father are one."

Considering the fact that later Buddhism developed out of its own elements a cosmic authority of conduct which practically serves the same purpose as the Christian God-idea, we cannot regard it as strange that Buddhists who lived in Judea should have adapted the Jewish theism to the trikâya of their own faith. The result could only be a trinity conception such as taught by the church.[1] Now if a Buddhist brotherhood had settled in Judea, they would have recruited themselves from Jews, and we can fairly assume that they naturally would have set on foot a movement like

[1] The development of the Christian Trinity is still shrouded in darkness. We know from passages in the Apocryphal Gospels that the Holy Ghost was identified by some of the old Christians with the Logos; and some considered the Third Person of the Deity as a feminine presence and the Mother of Christ.

that of the Essenes and the first Christian society at Jerusalem with its communistic ideals, its martyr spirit, and its invincible faith in the kingdom of truth.

It is often assumed that if the priority of Buddhism were proved, it would imply that Christianity would have to be regarded as a deteriorisation of Buddhism; it would deprive Christianity of all claim to originality, beauty, and truth. We might on the same argument say that Anglo-Saxon is a degenerated form of Low German, or that the polar bear is a degenerated species of the grizzly bear, or even that civilised man is a deteriorated anthropoid. Christianity embodies in its world-conception the best thoughts of the past from all quarters of the globe. The Logos idea was derived from Neo-Platonism, the God-idea is a Jewish tradition, baptism an Essenian rite, the holy communion reminds us partly of a Dionysian cult, partly appears to be a substitution of bread offerings in the place of bloody sacrifices;[1] the love of enemies was preached in a similar paradoxical form five centuries before Christ in the far East. The idea of a world-Saviour is Buddhistic. In a word, none of the elements of Christianity is radically new; nevertheless, the whole in its peculiar combination is decidedly original and marks the beginning of an era which stands in strong contrast to all the ages past.

---

[1] Justinus Martyr (Apol. I, 68), referring to a similar rite of distributing bread among the worshippers and handing them a chalice of water to drink that obtained among the Parsees, accuses the Devil of aping the Lord. While it is not impossible that the Parsees of Justinus's time had adopted some features of the Christian Sacrament, it is certain that the institution of the haoma-offering was an old established ceremony in Zarathustra's religion. It is of Aryan origin. Haoma is the Vedic *Sôma*, and the holy meat of Myazda, small pieces of which were eaten on little cakes called "draona," consecrated in the name of deceased persons, are the Vedic *hotrâ*. And it is said that he who drinks of the white haoma or Gao-kerena will on the day of resurrection become immortal. (See Darmstetter's *Introduction to the Zend Avesta in S. B. of E.*, IV, p. lxix and also the note on p. 56.) Zarathustra calls "the sacred cup and the haoma the best weapons to strike and repel the evil doer Angra Mainya." (*Ibid.* p. 206.)

It is possible that Buddhistic influence replaced the intoxicating haoma by water, while the Greek to whom wine was a symbol of holy enthusiasm again changed the water into wine.

The original meaning of breaking the bread must have been that in the new dispensation a loaf is sacrificed on the altar and not an animal. The oldest account of the Lord's last supper is found in Cor. xi, 23 et seq., and it is noteworthy that St. Paul neither mentions the Paschal Lamb nor the wine.

PARALLELISM WITH LÂO-TSZE.

Although it is true that the coincidences between Buddhism and Christianity are remarkable and numerous, and that their differences are easily accounted for, we must nevertheless concede that both religions may have originated independently. We possess the strange case of a similar parallelism to both Buddhism and Christianity in Lâo-tsze's philosophy which can hardly be suspected of being borrowed from either. We quote a few passages from his *Tâo Teh King*, which was written about six hundred years before Christ, and almost one hundred years before Buddha. The Chinese word *tâo* bears a peculiar likeness to the Greek term *logos*. It means "word," "reason," and "path or way" at the same time. The first sentence of the *Tâo Teh King* reminds us of the first verse of the fourth Gospel in the New Testament, and many other passages breathe the spirit of Christian ethics. We read in the *Tâo Teh King*:

"The *Tâo* (word, reason, path, or briefly logos) that can be *tâoed* (reasoned, argued with, walked on, or spoken) is not the Eternal Tâo. The name which can be named is not the Eternal Name. (Sec. 1.)

"Tâo produced unity; unity produced duality; duality produced trinity; and trinity produced all things. (Sec. 42.)

"Lay hold on the great form (of Tâo), and the whole world will go to you.

"Tâo, in its passing out of the mouth, is weak and tasteless. If you look at it there is nothing to fill the eye. If you listen to it, there is nothing to fill the ear. But if you use it, it is inexhaustible. (Sec. 35.)

"The great *Tâo* is all-pervading. It can be on the right hand and also at the same time on the left. All things wait upon it for life, and it refuses none. When its meritorious work is done, it takes not the name of merit. In love it nourishes all things, and does not lord over them. It is ever free from ambitious desires. It may be named with the smallest. All things return home to it, and it does not lord over them. It may be named with the greatest.

"This is how the wise man, to the last, does not make himself great, and therefore he is able to achieve greatness. (Sec. 34.)

"Recompense injury with goodness. (Sec. 63.)

"The *Tâo* of Heaven may be compared to the extending of a bow. It lowers that which is high, and it raises that which is low. (Sec. 77.)

"He who knows others is wise. He who knows himself is enlightened.

"He who conquers others is strong. He who conquers himself is mighty.

"He who knows when he has enough is rich. (Sec. 33.)

"The good I would meet with goodness. The not-good I would also meet with goodness. Virtue is good. The faithful I would meet with faith. The not-faithful I would also meet with faith. Virtue is faithful. (Sec. 49.)

"He that humbles (himself) shall be preserved entire. He that bends (himself) shall be straightened. He that is low shall be filled. He that is worn out shall be renewed. He that is diminished shall succeed. He that is increased shall be misled. Therefore the sage embraces Unity, and is a pattern for all the world. He is not self-displaying, and, therefore, he shines. He is not self-approving, and, therefore, he is distinguished. He is not self-praising, and, therefore, he has merit. He is not self-exalting, and, therefore, he stands high." (Sec. 22.)

The Buddhistic-Christian spirit of Lâo-tsze's philosophy is so striking that the suggestion has been made to trace its origin to the same sources in India from which Buddhism has sprung. But considering the fact that Buddha is almost a hundred years younger than Lâo-tsze this assumption is barely possible, not probable. And must we not grant that the Christian ethics if true may naturally develop in any country and in any age?

NOTHING AND THE ALL.

There are many remarkable agreements of all kinds which are due, not to a borrowing, but to a similarity of the circumstances which give rise to an idea or an event. So an Indian chief, who cannot be suspected of ever having read Cæsar, replied to the invitation of the President of the United States in almost the same terms as Ariovistus.

Among many peculiar coincidences of Buddhistic conceptions with ideas of thinkers who never came in contact with Buddhistic traditions, let me mention only one. Passerat, a late Latin poet of the sixteenth century, a native of France, (as quoted by Charles F. Neumann in his *Catechism of the Shamans*, London, Oriental Transl. Fund, 1831) says in one of his verses:

"Nihil interitus et originis expers
Immortale Nihil, Nihil omni parte beatum.
Felix cui Nihil est."

This expression praising the happiness of him who has attained the Nothing which knows the beginning and end of all things, the immortal nothing, which is blessed throughout, would be natural in the mouth of a Buddhist, to whom the word conveys different associations than to us, but it is startling when pronounced by a poet who in his surroundings had no chance of hearing the praises of Nirvâna.

A REACTION AGAINST DUALISM.

The similarity between Christianity and Buddhism must be due to a similarity of conditions. And such a similarity of conditions existed; yet here again we have good reason to believe that these very conditions were imported from India. If Buddhism was not directly transplanted to Palestine, it still remains quite probable that the seeds at least from which it sprang were sown by Buddhists in the soil of Galilee.

The main basis of all the agreements between Buddhism and Christianity lies in their similar attitude towards a dualistic and pessimistic world-conception. It is sufficiently known how Buddhism developed from the Sâmkhya system, and there can be no question that Christianity presupposes the prevalence of similar ideas in the minds of the people among whom Jesus Christ lived and taught—not among the learned only but among the multitudes.

The Essenes formed a faction among the Jews standing in opposition to both the conservative and old orthodox Pharisees and the liberal and Hellenised Sadducees. All that is known about the Essenes reminds us of Buddhistic monk fraternities and Hindu ascetics. There was a similar movement in those days among the learned Jews of Alexandria, which developed into Neo-Platonism, represented mainly by Philo (who died 54 A. D.), Plotinus (205–270), and Porphyry (232–304).

Lassen traces Neo-Platonism and Gnosticism back to India, and Professor Weber suggests the derivation of the Græco-Christian Logos-idea from the Indian "Vâch" (i. e., voice, speech, word), calling attention to the fact that the divine "Vâch," which in Sanskrit is a feminine noun, appears in numerous passages as the consort of Prajâpati, the Creator, in union with whom and by whom he

accomplished his creation. Professor Garbe, in his remarkable article in *The Monist* (Vol. IV, No. 2), not only confirms these suppositions, but, following Leopold von Schroeder's suggestion, offers abundant evidence for the derivation of Pythagoric views from the same source, India, which thus seems to have been the cradle of all our philosophies. We consider the hypothesis of a historical connexion between Buddhism and Christianity as very probable; yet at the same time must say that whether it is true or not is of little consequence. There are enough parallels concerning which we can be sure that they are not due to a borrowing, and such parallelism alone as obtains between Lâo-tsze on the one hand and Buddhism and Christianity on the other hand, is sufficient to prove that the evolution of both religions may have taken place independently, according to a natural law.

Whether or not the Sâmkhya philosophy and its offshoot, Buddhism, were transplanted from India to the Western world, we find that the Hindus not less than the Græco-Judæan thinkers arrived at a crisis in their religio-philosophical evolution in which they perceived the difference between soul and body, mind and matter, spirituality and sense-appearing reality. This difference once understood, leads easily to wrong conclusions. Before a monistic solution of the problem is sought, the dualistic view naturally presents itself first to a superficial consideration as the simpler conception. It was quite correct to regard mind as the all-important element of man's life, but it was a mistake, although it seemed quite plausible by way of contrast, to look upon matter as the source of all evil. Thus the Sâmkhya philosophers, and, in agreement with them, the Neo-Platonists, believe in the existence of two realities, matter and soul (or rather souls, for they assume a boundless plurality of individual souls), while material existence is looked upon as the cause of all misery and pain. The body is said to be that which hampers the mind and imprisons the soul as in a dungeon, while spiritual existence, or that which produces the illumination of consciousness in man, is praised as infinite perfection and divine bliss. Thus the world is cut in twain, and the logical consequence of this dualism is pessimism. This world of ours, the world of bodily existence in

which, as they say, the soul is imprisoned, is a domain of suffering (note here also the parallelism with Plato), and the highest aim of human exertion must be salvation from the bondage of matter. Hence asceticism and self-mortification. The death of the body was longed for because promising the liberation of the soul. Now Buddha, as well as Christ, rejected pessimistic ethics; yet it is noteworthy that they did not denounce it as altogether wrong; they only forbade the enforcement of it among their disciples, and regarded it as a lower and insufficient method of attaining salvation, or rather as a phase through which he who seeks deliverance must pass. They themselves had passed through it and rejected it. Therefore they suffered it still, but boldly disavowed its principles in their own conduct.

Thus, in the dualism of both the Sâmkhya philosophy and the Essenic ethics, as also in Neo-Platonism, a great truth, the idea of the all-importance of mind, was linked to fatal errors, viz., the duality of mind and matter, the fiction of a purely spiritual empire, and the escape from the material world to the spirit-realm through the suppression and gradual mortification—mortification in the literal sense of the word, which means the reducing to a state of being dead—of all bodily existence.

Buddha and Christ were confronted by the same dualism and facing the same problem of salvation, solved the problem in the same way. Both abandoned the traditional dualism and its pessimistic applications. After having tried world-flight, fasts, and self-mortification, they gave up all further attempts at uplifting the mind by a vain struggle against the body. Yet neither Buddha nor Christ surrendered the truth contained in the dualism of their predecessors. They recognised that the purpose of life lay not in the sphere of material reality, but in the realm of mind; that the life is more than meat, and that all worldly goods serve only as means for our spiritual needs. As to the problem of evil, they surrendered the dualistic method of deliverance through asceticism for a monistic ethics of righteousness. Both Buddha and Christ found that the source of sin lay deeper than in the complications of mind with matter; that material existence is innocent of wrong-doing, and that

mind alone makes or mars the world. Lust, vanity, and hatred do not reside in the objects of our senses, but in our hearts. A wrong-directed mind is the source of sin, and a purification of the mind from its sinful desires is the sole condition of salvation. Accordingly, both Buddha and Christ abandoned world-flight and self-mortification; they both returned to the world and gave offence to those who were still under the sway of a dualistic morality; they lived among the people, preaching the new way of salvation and the attainment of the kingdom of heaven that is within us.

In saying that Buddha and Christ abandoned the ethics of dualism and proposed a new system of morality that might properly be designated as monistic, we do not maintain that either Buddha or Christ taught a monistic philosophy. Neither Buddha nor Christ were philosophers, although the former can be called a philosopher with more propriety than the latter. Both were religious leaders; Christ more so than Buddha. Buddhism and Christianity are religions and not philosophies; yet from their first appearance when their founders began to preach the new doctrine, they ushered in an era of monistic thought. By discarding pessimistic principles and proposing a melioristic morality they led the way towards a monistic world-conception. The philosophy underlying their religious faith already shows a monistic trend.

As religions are slowly expanding and developing in the course of their evolution, so they cannot have originated without due preparation. Their growth is due to natural causes and takes place according to natural laws. St. Paul is generally considered as the founder of the Gentile Church; however, the existence of a Christian congregation in Rome to which he addresses the most important one of his epistles, is alone an undeniable evidence that he was one only among many missionaries of the new faith. Apollos, it is said in Acts xviii, 24, "taught diligently the things of the Lord, knowing only the baptism of John," and Paul coming to Ephesus, found "certain disciples who had not so much as heard whether there was a Holy Ghost" and were baptised unto John's baptism.[1] This is

[1]Acts xix, 1–2.

noteworthy. It proves that there were at that time, when Christian missionaries began to preach, Christian-like congregations who differed but slightly from those baptised in the name of Jesus Christ. It is not impossible that such communities of so-called "disciples" (which was also the name of the first Christians) were scattered even in the life-time of Christ over the whole Roman empire; in other words, the germs of Christianity existed before Paul organised them into Christian churches.

As the Gentile Church originated before Paul, so a pre-Christian Christianity must have begun to grow before Jesus. Apollonius of Tyana, p. 99, is an exponent of this spirit. He was in many respects similar to Jesus of Nazareth and the legends which his pious admirers told of his life bear so much resemblance to the Christian Gospels and Apocrypha that Christian fanatics have jealously destroyed the greatest part of them.[1] In a similar way Buddhism developed in India on parallel lines with Jainism. If Gautama Siddhârtha had not appeared, Jnyâtaputra, the founder of Jainism, might have taken his place. *Vice versa*, if Buddhism which had grown so much more powerful than Jainism, had not been rooted out in India, might not Jainism have been absorbed by it so as to disappear entirely? And if Jesus of Nazareth had not become the Christ of the Western world, might not Apollonius have played a similar part in history? We do not mean to say that Apollonius was near as grand or sympathetic a figure as Jesus, we only say that his character was of that type from which mankind would be inclined to select their Christs, their Buddhas, their Saviours. He was in many respects suitable to serve as a centre of religious crystallisation, and the sacred legends would have so moulded his personality as to make

---

[1]After his death Apollonius was worshipped with divine honors for a period of four centuries. A temple was raised to him at Tyana, which obtained from the Romans the immunities of a sacred city. His statue was placed among those of the gods, and his name was invoked as a being possessed of superhuman powers. The defenders of paganism, at the period of its decline, placed the life and miracles of Apollonius in rivalry with those of Christ; and some moderns have not hesitated to make the same comparison. There is no reason to suppose, however, that Philostratus entertained any idea of this sort in composing his life of Apollonius.—*Encl. Brit.*, Vol. II, p. 189.

of him an incarnation of the highest moral ideal of the age. In other words, if Jesus had not appeared, we might have substantially the same religion.

EVOLUTION IN RELIGION.

It is the habit of all religious devotees to look upon their religion as a fixed dogma. So many Buddhists imagine that true Buddhism consists in the teachings of Gautama Buddha, and Christians in the same way trust that the whole breadth and depth of Christianity was developed by Jesus Christ in his sermons, parables, and the example he set in his life. This is not so. Buddha and Christ were the founders, the one of Buddhism, the other of Christianity. It may be true that the most important features of both religions can be traced to their personal authority, but there are many phases in the development of mankind (so, for instance, the abolition of slavery) which were not thought of at the time either of Buddha or Christ. Neither Buddha nor Christ gave us in their sermons a rule for dealing with the slave problem; yet we cannot say that their spirit of brotherly love was not a most important factor in its final solution. The development of Christianity was not completed with Christ's crucifixion, nor was Buddhism completed at Buddha's death; both continued to grow and to work out the problems of life in the spirit in which their founders had set the example. They are still growing and we must be careful not to judge them according to the past alone, but consider the life that is in them now and also their future potentialities.

Buddhism and Christianity have not only developed the germs which were sown by their founders, but have also assimilated the religious experiences of other nations.

The original Christianity of the church at Jerusalem, changed when it spread over the Roman empire; and it changed again when introduced among the Teutonic races of the North. Our present Christianity, for instance, contains more of the Teutonic race ethics than many of us, especially our clergy, are aware of and is very different, indeed, from the original Christianity of the communistic church at Jerusalem. Buddhism, too, has undergone changes. The

Hinayâna of southern Buddhism is marked by a certain negativism, while the Mahâyâna of northern Buddhism makes the positive aspect of the Dharma and of Nirvâna more prominent. Among the Tibetans this tendency of the Mahâyâna doctrines has developed a fantastic mythology and the ecclesiastical institutions of Lamaism, while the more sober Japanese appear to be quite scholarly and freer from superstition.

THE SUPERNATURAL IN THE NATURAL.

Taking it for granted that Buddhism and Christianity have not influenced each other and are of independent growth, their similarities will have to be regarded as the more remarkable, since they will then all the more render a special revelation theory redundant. They are a most powerful argument for a sweeping latitudinarianism, and will, if properly understood, crush the last remnant of sectarianism in Christianity. Shall we say that the injunctions: "Recompense injury with goodness," and "hatred does not cease by hatred; hatred ceases by love," have naturally developed the one in China and the other in India, while the same lofty moral thought could be attained in Judæa only through a supernatural revelation? No, the supernatural will develop everywhere according to the eternal laws of nature.

The sky, in old folklore tales, is conceived as a glassy bowl that covers the earth, and the Indians imagine themselves favored by Manitou, the Great Spirit, who located them under the very top of the heavens. Let us not imitate their narrow-mindedness by believing that we alone are blessed with the zenith of a religious revelation. God spoke not through Moses alone nor through Jesus alone. God has left no one without a witness, and he speaks to every one of his children in the same way, if they but open their minds to perceive his revelation. The Zenith is over the heads of every one who raises his eyes to look up to it, and there is no part of nature but it contains the supernatural. The natural is supernatural all through. Thus we need not wonder that the foundation-stones of Buddhism and Christianity are the same; they are of a universal nature, and we are justified in assuming that if there are rational

beings on other planets, they, too, will develop in the course of their religious evolution a religion of deliverance from evil by walking in the noble path of righteousness. Among them, too, a saviour will rise to bid them renounce their self and all selfishness, and to take refuge from the evils of existence in an all-embracing love.

We deny the existence of the supernatural in a dualistic sense; but suppose we call such higher features of nature as appear in man's ethical aspirations hyperphysical or supernatural because they rise above the lower and purely physical elements of the universe, we must confess that the supernatural lies hidden in the natural and is destined to grow from it according to the cosmic law of existence. All living creatures face the same universe and are confronted with the same problems of life; must we not, in the end, all come to the same conclusions, and, however different may be the modes of presenting them, adopt the same rules of conduct? In the light of a unitary world-conception the agreement between various religions ceases to be startling and finds, even on the assumption that they have developed quite independently, its natural explanation.

HINÂYÂNA, MAHÂYÂNA, MAHÂSÊTU.

Recognising a continued evolution in the religions of mankind, we do not look upon later Buddhism with the same contempt as is customary among many Buddhist scholars. It is true that the old Buddhism of the Hinayâna school has preserved the old traditions more faithfully and is more philosophical than religious, while the Mahâyâna school which now obtains in the North, especially in Thibet, in China, and in Japan, is more religious than philosophical, almost hiding Buddha's doctrines under an exuberant outgrowth of fantastical superstitions. We must, nevertheless, recognise in this progress from the Hinayâna, or the small vehicle of salvation, to the Mahâyâna, or large vehicle of salvation, an advance in the right direction. Buddha had taught his disciples the path of salvation and had inculcated an unbounded love for all mankind, including one's enemies. It was quite natural that his followers were anxious to extend the blessings of salvation to all mankind. The

Hinâyâna is a religion for the thinker, for the wise, for the strong; it is not a gospel to those who are poor in spirit, who are ignorant, who are weak; and yet it was the principle of the Master's all-comprehensive compassion to save *all* the world! What was more natural to a true-hearted Buddhist than to make the blessing of Buddha's religion accessible to the multitudes? The small canoe of the Hinâyâna sufficed for every one only to save himself and no one else. But what did a Buddhist care for his own salvation? A true Buddhist had ceased to be troubled about himself. He wanted to save others. Thus the general idea of a Mahâyâna, a large conveyance of salvation, of a great ship to cross the stream of worldliness, of sin, and suffering, was a logical consequence of Buddha's doctrine, even though the methods with which this idea was realised may in many respects be regarded as a failure. Yet in judging the Mahâyâna system and its fantastical offshoots, we must consider the mental state of those nations for whom it was adapted, and it may be that a purer religion would have failed utterly where cruder allegories of what appears to us as childish superstitions exercised a beneficent influence. The Mahâyâna has changed the savage hordes of central Asia, from whom proceeded the most barbarous invaders, dreaded by all their neighbors, into a most kind-hearted people, with a sacred passion for universal benevolence and charity.

Considering the development from a Hinâyâna conception to a Mahâyâna practice as an advance, we can still less regard Christianity, even if its derivation from Buddhism were certain, as a deterioration. Buddhism, viz., the original Buddhism of Buddha, is more philosophical and more abstract than Christianity, but Christianity is more religious. Buddhism, viz., again, the original Buddhism of Buddha, is free from all mythological elements while Christianity employs a number of allegorical expressions which are both appropriate and forcible. There is the dogma of the personality of God, of the Sonship of Christ, of the quickening influence of the Holy Ghost, of the personality of Satan, of angels and devils, of heaven and hell; and even to-day the belief in the literal meaning of all these religious symbols is counted among many Christians as the test of orthodoxy. What does it matter that during the develop-

ment of the Church they have crystallised into temporarily fixed dogmas, which sometimes threatened to ossify the properly religious spirit of Christianity? The symbolism of Christianity is after all its dross only; its essence is that ethical spirit which it has in common with Buddhism. The Christian dogmatology, if properly recognised in its symbolical nature, is most beautiful, expressive, and true, but if taken in its literal meaning commits us to irrational absurdities. He who believes in the letter of a myth, or a dogma, or a religious allegory, is a pagan, and Christian paganism is not less absurd than Lamaistic or any other paganism. Nevertheless, he who believes in a myth that contains in the garb of a parable a religious truth, and accordingly regulates his moral conduct, is better off than he who is void of any faith. The truth hidden in the myth teaches him and serves him as a guide; it comforts him in affliction, strengthens him in temptation, and shows him in an allegorical reflexion the bliss that rests upon righteousness. The Hinâyâna, in its abstractness, it appears to us, is indeed insufficient for the masses of mankind, and had to change into a Mahâyâna system before it could conquer almost half the world. Christianity, however, is more perfect even than the Mahâyâna of Buddhism, as a vehicle of salvation for the masses of mankind. While the schools of Buddhism may be compared to ships that cross the stream, Christianity is like a large and solid bridge. Christianity is a Mahâsêtu. A child may walk over in perfect safety. Christianity is, as St. Augustine says, like a water in which a lamb can wade while an elephant must swim. It is difficult to explain spiritual truths to an untrained mind, for even philosophers find it difficult to understand why we must free our souls from the thought of self and overcome all vanity, lust, hatred, and ill-will. But a young Christian heart finds it very natural. Without going through all the painful experiences which lead to the abandonment of selfishness, a Christian child having received Jesus and his all-comprehensive love into his heart is, on the start of his life, placed in the right moral attitude towards the world. Christianity has been especially successful in teaching surrender of self without at the same time disturbing the egotism so strongly developed in Western nations. In a word, Christianity extends the bliss of

righteousness not only to the ignorant who do not understand the problem of life of which Christian ethics present a practical solution, but also to those whose eyes remain still covered with the veil of Mâyâ; yea, even to the little children who have never as yet heard of sin or the cause of sin. There is no more characteristic saying of Christ's than his words: "Suffer little children to come unto me."

No fault can be found either with Christianity or the symbols of Christianity, but blame rests with those who claim that the Christian symbols do not merely contain the truth in the language of parables, but that they are the truth itself, the absolute truth which must be accepted in blind faith whatever be the verdict of a rational inquiry or scientific criticism. The Christian whose faith consists in obedience to the spirit of Christ's ethics can shake hands with the Buddhist and say, we are brethren; our religions solve the problems of life in a similar spirit, although we differ in our modes of expression. The Christian, however, whose faith is a belief in the letter of his dogmas may regard the Buddhist, be he ever so highly educated, as a pagan and Buddha as a false prophet or even "an imposter."[1] The latter kind of Christianity is still regarded as orthodox, but the time will come and is near at hand when its flagrant paganism will be recognised by the very authorities of the Church. The former kind of Christianity will be established as the only true Christianity, and the old narrow orthodoxy of bigotry and blind faith will be supplanted by the new broad orthodoxy of scientific truth.

Christianity, at present the second largest religion in the world, can very well become the universal religion of mankind, but there is one condition which must be fulfilled before it can gain the victory. It must discard all paganism; it must become conscious of the symbolical element of its symbols; it must with impartial justice recognise the truth wherever it be; it must be courageous enough to acknowledge its own errors of former misinterpretations, and appreciate the good that is contained in other religions; in a

[1] See Spence Hardy in his *Legends and Theories of the Buddhists*, p. 207.

word, it must become a cosmic religion—truly catholic and orthodox.

What is more orthodox than that which with methodical exactness has been proved to be true, and what is more catholic than science? We must learn to understand that science is a religious revelation.

This, in essence, is the lesson which a comparison of Buddhism with Christianity can teach us: Above any Hinâyâna, Mahâyâna and Mahâsêtu is the Religion of Truth, and the truth reveals itself everywhere, to every one who has the religious spirit to seek it, and dares to find it.

EDITOR.

ON THE NATURE OF THOUGHT.

DOES human thought take its origin wholly from practical needs, or is there in it from the first a disinterested element?

Some modern psychologists would say, not only that it takes its origin from needs and is posterior to action, but that it always remains in its whole structure subservient to practical ends. Just as some ancient thinkers held that virtue was simply a kind of knowledge, so for these moderns thought is nothing more than a kind of will; will itself being assumed to be primarily directed to practice. What distinguishes thought from mere trains of associated ideas is that the passive states of consciousness that enter into it are seized upon by an active "apperception," and, by being thus seized upon, are turned into connected "thought-series." The device of these psychologists might be: "*Pro ratione voluntas.*"

If, in opposition, we were to point to the Aristotelian ideal of the self-contained contemplative life, they might admit this to be a possible ideal and still maintain the essential part of their view. Perhaps they would not admit its possibility; but if they did, it would be open to them to insist that the contemplative life is still in a manner active. It is certainly not without volition. At most the volition may be supposed to become in the end unimpeded. And it is undoubtedly an ideal that in more than one way presupposes strictly practical activity in some kind of relation to it. Neither a society wholly devoted to contemplation, nor an individual human life filled with it from beginning to end, is imagined by Aristotle as possible. To decide the question as to the nature of thought, we must consider its origin rather than its consummation.

But first of all, whence comes the notion itself that thought is merely a kind of volition? It is derived, in reality, from a great philosopher; but it seems to imply either a misunderstanding or an exaggeration of his view. Descartes, in the *Principia Philosophiæ*, seeking to explain the causes of error, drew attention very forcibly to the volitional character of some thought. But he does not say that all thought is volitional. The passage where the doctrine may be found is Part I of the *Principia*, sections 31–36. The doctrine is this. Our errors depend on the will rather than on the intellect. All our modes of thinking (*modi cogitandi*) may be referred to two general ones: perception, or the operation of the intellect; volition, or the operation of the will. Feeling, imagination, and pure understanding, are modes of perception; desire, aversion, affirmation, negation, doubt, are modes of will. (*Nam sentire, imaginari, et pure intelligere, sunt tantum diversi modi percipiendi; ut et cupere, aversari, affirmare, negare, dubitare, sunt diversi modi volendi.*) When we affirm or deny of a thing that which we clearly and distinctly perceive must be affirmed or denied of it, we do not err. But, in order that assent may be given, not only perception but also will is required. Now the perception of the intellect extends only to a few things. It is always finite, while the will is in a manner infinite. There is no possible object of any will that cannot become the object of our will, even though we do not clearly and distinctly perceive it. From extending the will that is involved in judgment to things we do not rightly perceive, arises error.

It is evident that Descartes here does not attempt to explain thought in general as a form of volition, but only judgment in the special sense. From judgment, implying assent or denial (modes of volition), is distinguished pure understanding or pure intelligence which is wholly a "mode of perception," and to volition perception is opposed as another "mode of thought." "Perception" was of course to the older psychologists a vaguer term than it is now. It did not mean simply perception of particular objects. We may take Descartes's "pure intelligence" as meaning very much what we mean by "conception," as distinguished from judgment.

Judgment itself, which is admitted to be volitional, may be ex-

plained psychologically in different ways. The question has been put with regard to volition in general, whether it is essentially constituted by a primitive "act of apperception" that cannot be further resolved, or takes its origin from mental elements that do not at first constitute anything that can be called volition. In this last case, "apperception" or "attention" is itself a problem, and cannot be used as a datum of psychological explanation. This is the view of Professor Bain and of Dr. Münsterberg. The view that apperception must be taken as a datum is that of Professor Wundt.

However this controversy may be decided, the question still remains as to the nature of conception (Descartes's "pure intelligence") in its distinction from judgment. Professor Wundt and his disciples would explain not simply judgment but thought in general as a kind of volition; or rather, they would probably say that all thought, in the proper sense of the term, is judgment.

The argument against this view is that it ignores the whole work of modern nominalism. The English nominalists, beginning with Hobbes, set themselves to explain what is distinctive in thought as a whole, not simply in its recognised volitional form, and attained what seems a true psychological solution. They took the essential element in thought to be generality; and the possibility of generalising they explained by the existence of language. To rise from mere trains of association to general conceptions, what is necessary is a system of signs; and this is given by articulate speech. "Speech created thought." One particular perception or image—the sound or memory of a word—can be made to stand for a whole class of other images and perceptions. Man is distinguished from the lower animals by the capacity of evolving such a system. The distinctively human faculty is the power of speech and thought.

This theory has not been sufficiently considered by the apperceptionists. Still, they might conceivably accept it and push the question further back. Language itself, they might say, is the product essentially of will. All thought, therefore, must still be traced to "apperception."

There is, undoubtedly, in all choice of speech, an element of volition; as, in fully formed thought, volition enters into judging.

But is volition, in the origin of language, the essential thing? To hold that it is, does not seem to be in agreement with the best view of modern thinkers on the subject, which may be briefly stated thus. Language presupposes society. Given a group of social animals, as soon as uttered sounds aroused by certain ideas call up similar ideas in the minds of those to whom they are addressed, there is the germ of language. This germ consists in understanding, not in intentions. Sounds, once understood, can become words. What is needed is the intellectual power that can develop them.

In the case of some languages, this intellectual power seems to have consisted mainly in volition. The suggestion that the Chinese language was essentially volitional in its origin is an obvious one. Leibnitz, discussing the old question whether languages are by institution or by nature (*Nouveaux Essais*, Bk. III, Ch. 2), remarks that the language of China has been thought to be "entirely arbitrary." This, he proceeds, may be so; but the artificial languages of which we know the origin contain a "natural" as well as an "arbitrary" element. Modern philologists would say that there is something of Leibnitz's "natural" element everywhere. Signs, in the beginning, cannot be quite arbitrary, but, to be taken up by others, suppose some kind of correspondence to the thing signified, though not of course a uniform correspondence alike for all men at all stages. In the end, for ordinary speech, words become arbitrary signs, though in the evolution of language they were not so. The reason why the Chinese language seems most of all arbitrary or volitional is its extreme poverty both of vocabulary and grammatical system. Out of about five hundred monosyllables, by changes of tone and of syntactical arrangement, the whole spoken language is constructed. The share of arbitrary choice in the structure becomes conspicuous from the limitation of its material. Yet we perceive that even here the linguistic material cannot have been created by volition aiming at practical ends, but springs originally from the play of feeling and imagination. Such as it is, an eminently volitional language is in conformity with the intensely positive and practical Chinese character. It is the language of a race with neither poetry nor meta-

physics. The copious languages are the languages of races with a larger primitive endowment of imagination or feeling.

Still, this does not settle the question with which we began. Whatever may be the peculiar endowments of different races, is it not always practical need that gives the first stimulus to expression, and so ends by creating thought? That practical needs count for much in the development of thought and language is of course unquestionable. It does not follow, however, that they gave the first impulse. Animals also have "reason" in the sense that they can intelligently adapt means to ends; but in animals the disinterested emotion aroused, for example, by novelty, though not entirely absent, is merely sporadic. In the history of human life, on the other hand, there is, as a rule, a search for the æsthetic before the useful is sought for. Is it likely that language is here an exception? The question is not as to the external occasion on which language arose. As has been pointed out in recent discussion of the subject, the occasion may not always have been the same. The fundamental question is this: What is the internal psychological cause by which it is first determined that there shall be articulate expression at all?

To find a clear solution of this question, we must return to the first of the modern Nominalists, to Hobbes. In the treatise commonly known as the *Human Nature*, but recently published by Dr. Tönnies as part of the whole to which it originally belonged, namely, *The Elements of Law, Natural and Politic*, there occurs a paragraph (Ch. 9, § 18; ed. Tönnies, pp. 45–46) in which the problem is incidentally solved. Hobbes is treating of the passions he calls "admiration and curiosity," by which, as also by "the faculty of imposing names," man is distinguished from beasts. "For when a beast seeth anything new or strange to him, he considereth it so far only as to discern whether it be likely to serve his turn, or hurt him, and accordingly approacheth nearer it, or flieth from it; whereas man, who in most events remembereth in what manner they were caused and begun, looketh for the cause and beginning of everything that ariseth new unto him. And from this passion of admiration and curiosity, have arisen not only the invention of names, but also the supposition of such causes of all things as they thought

might produce them. And from this beginning is derived all philosophy: as astronomy from the admiration of the course of heaven; natural philosophy from the strange effects of the elements and other bodies."

The luminous suggestion that "the invention of names" has arisen from "admiration and curiosity" is in perfect agreement with the view that derives theoretical science from the same origin. That it is essentially these two passions that set science going and keep it in movement is sufficiently clear from experience. Practical needs lead to applications of the science that exists, and these applications again determine new theoretical problems; but they are not the central cause of the pursuit of science. From this pursuit, the usual effect of practical needs is to draw men away. They may direct the attention of societies to the importance of science, but they will not determine individuals to follow it. To work at science strictly in view of practice keeps it stationary. We see this in the cases of Egypt and Chaldæa, where geometry was kept to the purpose of land-measuring and building, and the stars were observed chiefly with a view to predicting events that had a bearing on national or individual prosperity. The same thing holds of language. Its beginnings were theoretical, æsthetic, disinterested. To a great extent its development depends on persistence of the original impulse; on the leaving of men's minds in some measure free from subjugation to external ends and motives. Literature has a larger vocabulary than daily life. The vocabularies of the Aryan and the Mongolian are at opposite extremes. To develop a utilitarian civilisation too early was to lose possibilities both of scientific and linguistic growth. Language, as Hobbes saw, like the search for causes, springs from what is distinctively human in human nature; and this is not direction of the mind to the interests of life. The large part interests play in Hobbes's practical philosophy only makes his position on this point the stronger.

With the question about language, the question about thought, from which we started, is solved.

London. Thomas Whittaker.

LITERARY CORRESPONDENCE.

FRANCE.

M. G. Milhaud just publishes his *Leçons sur les origines de la science grecque*, a highly interesting work, from which the students to whom it is addressed will derive much profit. The source from which M. Milhaud has drawn his materials is the remarkable and learned work of M. Paul Tannery, *Pour l'histoire de la science hellène (de Thalès à Empédocle)*. Although this latter work dates back to 1887, I must mention it here as an authority of the first order for the study of scientific theories.

To construct the history of science is tantamount to a construction of the history of philosophy. Every serious philosophical education should commence at this point. How can we estimate the worth of the theories which have succeeded one another in the progress of the centuries if we are incompetent to judge of the facts upon which scientists and philosophers have successively founded their hypotheses? Modern doctrines would resemble fairy tales to one who did not give some study to the habits grafted in the human mind by the disciplines of times gone by, and to the new conditions which a new science imposes on thought. What a host of intermediary links exist between these centuries of Greek history which M. Milhaud[1] and M. Tannery call to life again, and the modern epoch to which M. Ch. Adam brings us in his book, *La philosophie en France (Première moitié du XIX. siècle)*!

[1] I shall simply mention to-day M. Milhaud's dissertation for the degree of doctor, which he publishes under the title, *Essai sur les conditions et les limites de la certitude logique*.

M. Adam's book is a fine performance, and I may recommend it to persons desirous of becoming acquainted with the evolution of ideas in our country. Its analyses are made with lucidity, sobriety, and with no pretension except that of exactitude. In the first part we see marshalled M. de Bonald, Joseph de Maistre, Lamennais, Lacordaire, and Montalembert, the representatives of a movement effected entirely within the bosom of Catholicism; in the second part, Maine de Biran, Ampère, Royer Collard, Cousin, and Jouffroy, a philosophy of half-blood, as it were, which remained too Voltairian for religion, too metaphysical for science, and too subjective for practice; in the third part, Saint-Simon, Fourier, Pierre Leroux, Jean Reynaud, and finally Auguste Comte, men of unequal ability, but all of whom represented the positive philosophy, took a strong interest in real life, and conceived philosophy in its last offices as a social and religious discipline. To these belong the future,—we can see it in the lasting influence of Comte,—for they had a very just feeling of the needs of modern times. M. Adam cheerfully recognises this, and I am not the one to reproach him for his preferences in this matter.

* * *

In the departments of physiology and psychology I shall mention first the French translation by M. P. Langlois of A. Mosso's book, *La fatigue intellectuelle et physique*, upon the whole an excellent, instructive, and pleasant work, but slightly discursive. Two conclusions, in my opinion, follow from M. Mosso's researches. The first is, that although fatigue is the condition of progress, it ought not to be imposed upon man too early in life; the other, that we are complicating life too much and constantly rendering it more artificial. The education of children, being confided to common pedants, often begins with thwarting nature, and an excessively refined civilisation ends with deforming it. Taine said one day, in the pardonable freedom of conversation: "The prevalent system of education is one of the greatest abuses of the present century; but we must not speak evil of it, at least openly, for there are many people who make their living by it." Meanwhile, serious educators may be found, and these will profit by Mosso's work.

But it is still not said that fatigue has no other cause than productive labor, the overwork of brain and muscles. It also springs from vice, and the degeneration, which arises from social illness, constantly contributes to augment it. To this question of fatigue Dr. Paul Aubry's work, *La contagion du meurtre, étude d'anthropologie criminelle*, is devoted.

Dr. Aubry shows by examples that murder is contagious, and that this contagion is spread by the habits of families, by the living together of prisoners, by the witnessing of public executions, and, finally, by the press. On this last point Dr. A. Corre, who has written the preface to this work, is not of the same opinion with M. Aubry. The latter asks for laws repressing the liberty of writing and of speech; the former is a partisan, though an uneasy one, of the absolute liberty of the daily press, books, and speech. Good reasons, *pro* and *con*, are not wanting, yet I think that it is possible and prudent to prohibit at least the *illustration* of crimes in public journals, and so prevent the spread of this contagion by *pictures*, which are so suggestive. With respect to the discretion to be observed in newspaper reports, the good-will and assent of journalists are hardly to be expected; they would be loth to sacrifice reasons of interest to reasons of morals. Did we not hear, only a few years ago, the representatives of the Parisian press declare legitimate the publication of documents abstracted from the depositories of the courts of justice!

"The means of bettering this condition of affairs," thinks M. Corre, "is to be sought wholly in a system of instruction and education fully adapted to the wants of modern society." No doubt. But that is sooner said than done, while in the meantime the dangers of a life without religious or scientific discipline are aggravated. Even certain moral habitudes which take the place of rules in life are falling into desuetude.

* * *

Restorations are improbable and invariably inefficacious. One is obliged to recognise this fact anew after the perusal of such studies as those put forth by J. E. Alaux, under the title of *Philosophie morale et politique*. M. Alaux is a man of elevated thought

and possesses a deep sense for the difficulties which weigh down upon us. But the spiritualistic deism to which he has remained faithful no longer satisfies us, and it would scarcely seem as if the unity of human consciousness was to establish itself in the future on the principles of the old spiritualism. That the reaction has been excessive I do not deny, and every voice merits the privilege of an audience if only it is sincere.

Still, it is impossible for me to attach much importance to attempts at the rejuvenation of existing religions, which are especially manifested in the Reform Churches, more flexible than the Roman. This latter, indeed, has picked up again in the doctrines of Thomas Aquinas a certain philosophical direction ; but I see by recent works that the most advanced members of the clergy do not dare to renounce the doctrine of miracles. To seek to-day one's point of support in ignorance approaches the tactics of despair. I shall refer the curious reader of works of a theological character to the reviews of M. F. Pillon in the *L'Année philosophique*, 1894.

There is much talk about the Buddhistic propaganda. It is with us a mere fad. Even persons who are afflicted with a taste for the supernatural and the marvellous do not seem disposed to fetter themselves with the rules of the past. With much more reason, therefore, do our liberal minds dismiss with a smile our few panegyrists of the Asiatic religions. "There is no reason why a man who has been released from one prison would strive to enter another," we read in the sprightly and forcible *Current Topics* of General Trumbull, to whose memory I may be permitted to address a word of sincere and respectful homage from France.

* * *

I have not to speak of purely literary works here. There are, however, two studies of Victor Hugo which I should mention, as they relate partly to psychology. The one is from the pen of M. Ch. Renouvier, *Victor Hugo le poète*, (A. Colin, publisher,)[1] the other by M. L. Mabilleau, *Victor Hugo*, (Hachette, publisher).

[1] Works not thus excepted are published by F. Alcan.

The reader will find here some excellent pages on the question of images and imagination, with many valuable remarks.

The last work of M. Ch. Letourneau, *L'évolution littéraire dans les diverses races humaines* (L. Battaille, publisher), raises a question of broad scope. M. Letourneau continues in this volume the laborious investigations which he has undertaken regarding the evolution of the fundamental facts of society, evolution, family, property, politics, law, and religion. It is not possible, one will think, to attack subjects as diverse as these with equal competency. And the author's criticisms are not always exact. He has reached, however, solid results, agreeing in his main points with M. Ernst Grosse who published simultaneously in Germany a remarkable work under the title *Die Anfänge der Kunst.*

M. Letourneau points out to us the original union among all nations of dancing with music and poetry; the exceptional importance of dancing from the point of view of social interests; the origin, in the pantomime or mimetic dance, of the drama, which would be thus a primitive form and not appearing by necessity after the epic, as the exclusive study of the Greek classics have induced people to believe. He has clearly pointed out the predominance of rhythm in the music and poetry of savages without mentioning their feeble sense for musical intervals, which is frequently almost null according to the inquiries of M. Grosse.

But to what extent is the fate of literature connected with the social conditions in which it appears? M. Grosse responds to this question with the invocation of an economical element, *production*—a precise criterion, but one which becomes insufficient as soon as we go beyond the primitive stages of humanity. M. Letourneau, whose researches properly extend further back, has sought to trace literary evolution to political evolution, making this last consist chiefly in the passage of the communal clan or republican rule to a monarchical form of government. Unfortunately he does not develop his law with sufficient exactness and the passage or transition of which he speaks escapes us as soon as we replace his words "republic" and "monarchy" with actual facts.

But this remains true, that prolonged oppression, no matter

what its source, and the exercise of extreme authority, result in stopping the expansion of human genius, as soon as a race has not, or no longer has, a sufficient reserve energy. This statement, however, is simply tantamount to saying that the literature of a people declines with its vitality, and the causes of this decline present to us a vast and difficult problem. Some of these causes M. Letourneau points out. Especially is he not assured of the future of the peoples of the West. His picture would have been more complete if he had said that the nations are menaced with incapacity for discipline as much as by excessive discipline. No doubt, the deep-seated evil here resides in the absence of moral cohesion, in the growing triumph of egoism over altruism. But this mortal consequence may set in under forms of government and political conditions which widely vary.

But what becomes, in all this, of the vague factor of *race*, which M. Taine, for example, has so overtaxed. The genius of the race is a character which must not be absolutely neglected. Still one will observe that the results set forth by M. Letourneau (and this is a circumstance which has not escaped M. Grosse), are equally justified by the study of tribes belonging to different ethnical groups. The influence of race, accordingly, bears more upon the quality of literary works than upon the general evolution of literature. With respect to the law of evolution, this yet remains to be discovered. At all events, it is much to understand history better, and the possession of exact descriptions is a great step in advance.

Lucien Arréat.

Paris.

CRITICISMS AND DISCUSSIONS.

THE LIFE OF ISSA.

About a year ago a little book was published in French by a Russian who calls himself Nicolas Notovitch, and its title is *The Unknown Life of Jesus Christ, by the Discoverer of the Manuscript*. The sensation which it naturally created has made it known over the whole civilised world, so that the English translation which we now have before us commands an extraordinarily large sale.

Mr. Nicolas Notovitch's book is a curious and interesting production. It contains the accounts of the author's journey to Tibet. There are a few thrilling hunter's stories. Our hair is made to stand on end by the report of the horrible death of a coolie in the clutches of a hungry panther, devouring his victim and escaping in the dark. We hear of the successful killing of a black bear. The mind is relieved by an ethnological discussion of the piquant institution of polyandry; then again our attention is engaged by a dramatic description of a pageant such as we are accustomed to witness on the stage. Several discussions with Buddhistic lamas are introduced whose long speeches are ill-disguised reproductions of the author's own religious views, which occasionally ooze out in other parts of the book. Hearing of a manuscript on the life of Issa (which is the Tibetan form of the name of Jesus), he sets out in search of the manuscript of the valuable work, and at last happily finds it through the unfortunate accident of a broken leg. Here again the author surprises us with a report of wonderful adventures, and we must admire his extraordinary physique and almost superhuman endurance. Having broken his leg above the knee, he orders his servants to take him to Himis, which, as he says, was only half a day's journey, one man constantly supporting his injured limb, another man leading his horse by the bridle. Having reached Himis at a late hour of the night he was well received by the monks and borne to their best chamber. Without telling us how he passed the night, he continues:

"The succeeding morning I encased the injured member in thin boards held together with strings, and did my best to remain motionless. A favorable result was soon apparent, and two days later I was well enough to undertake a slow journey toward India, in quest of a physician."

In these two days, which, after half a day's journey with a broken leg, he spent at the Himis convent, Mr. Notovitch found sufficient composure to make himself acquainted with the contents of the manuscript of the life of Issa. He says:

"The venerable director of the gonpa entertained me with interesting accounts of their belief and the country in general. . . . Finally, yielding to my earnest solicitations, he brought forth two big volumes in cardboard covers, with leaves yellowed by the lapse of time, and read the biography of Issa, which I carefully copied from the translation of my interpreter."

Then follows the translation of the manuscript of the life of Issa, with the author's comments. The manuscript gives in Sections II and III a brief report of the history of the children of Israel, making, however, Mossa (Moses) the younger son of King Pharaoh. The fourth section informs us of the Eternal Spirit, who sees fit to incarnate himself again in a human being. The child is called Issa; and having attained the age of thirteen years, when an Israelite should take a wife, he clandestinely left his father's house and travelled towards Sindh, "to study the laws of the great Buddhas." Section V tells us of Issa's experiences in India, his denial of the divine origin of the Vedas, his denial of the Trimurti, his denunciations of Hindu caste institutions, and his condemnation of idol-worship; he said:

"The Eternal Judge, the Eternal Spirit, composes the one and indivisible soul of the universe, which alone creates, contains, and animates the whole.

"He alone has willed and created, he alone has existed from eternity and will exist without end; he has no equal neither in the heavens nor on this earth.

"The Great Creator shares his power with no one, still less with inanimate objects as you have been taught, for he alone possesses supreme power.

"He willed it, and the world appeared; by one divine thought, he united the waters and separated them from the dry portion of the globe. He is the cause of the mysterious life of man, in whom he has breathed a part of his being.

"And he has subordinated to man, the land, the waters, the animals, and all that he has created, and which he maintains in immutable order by fixing the duration of each.

"The wrath of God shall soon be let loose on man, for he has forgotten his Creator and filled his temples with abominations, and he adores a host of creatures which God has subordinated to him.

"For, to be pleasing to stones and metals, he sacrifices human beings in whom dwells a part of the spirit of the Most High.

"For he humiliates them that labor by the sweat of their brow to gain the favor of an idler who is seated at a sumptuously spread table.

"They that deprive their brothers of divine happiness shall themselves be deprived of it, and the Brahmans and the Kshatriyas shall become the Soudras of the Soudras with whom the Eternal shall dwell eternally.

"For on the day of the Last Judgment, the Soudras and the Vaisyas shall be forgiven because of their ignorance, while God shall visit his wrath on them that have arrogated his rights."

Note here how modern Christ is when referring to the labor question.

"Six years later," we are told in Section VI, "being persecuted, Issa, whom the

"Buddha had chosen to spread his holy words, went from place to place preaching "monotheism, denouncing idolatry, and proclaiming the ethics of universal kindness. "At last he returns to Palestine, where the rulers of the cities, and especially Pi- "late, the governor of Jerusalem, attempted to take his life, but the priests and the "learned men of the Hebrews defend him and succeed for some time in protecting "him. The spies of Pilate, however, succeed in implicating Issa into new accusa- "tions, whereby Issa takes occasion to admonish his disciples to respect women "and to be submissive to their wives. Put into a dungeon, the Jews tried to save "him, but in vain, and Issa was nailed to the cross between two thieves. The "priests and the wise men of the Hebrews washed their hands in a sacred vessel, "saying: 'We are innocent of the death of a just man.' As the multitude prayed "over the tomb of Issa three days after his death, and filled the air with weeping "and wailing, the governor, fearing a general uprising of the people, sends his "soldiers to take up the body and bury it elsewhere. When the sepulchre was "found open and empty, the rumor was spread that God, the Supreme Judge, had "sent his angels to take away the mortal remains of the saint in whom dwelt a part "of the Divine Spirit."

The comments which the author adds are peculiarly interesting as they furnish abundant evidence that the manuscript is nothing but an exposition of Mr. Notovitch's own religious opinions. Yet he appears honestly to believe in the anachronism that his views were held at the beginning of the Christian era, for he does not seem to doubt that the life of Issa as told in the Himis manuscript was written shortly after Christ's death.

After this analysis of the book, which is a mixture of everything which is liable to excite the reader's sentiments, it is scarcely necessary to enter into a detailed criticism or to raise the question whether or not the manuscript is genuine. Mr. Notovitch expresses his confidence that further investigations will verify his report. Up to date we have little evidence which will verify or contravene Mr. Notovitch's statements; but the little which we have is against him. According to the Philadelphia *Sunday School Times* "The Rev. F. B. Shawe, a Moravian mis- "sionary of Leh, the chief town of Ladakh, has just asserted (1) that Buddhists do "not venerate Jesus, or Issa, at all; (2) that his colleagues have had easy access to "the very monastery named by Notovitch for forty years, and never so much as "heard of such a Life; (3) that no one in that vicinity can be found who has seen "or heard of Notovitch; (4) that the monks deny that they have any old books,— "least of all, one 1694 years old, or a copy of it; and that (5) Pâli is an unknown "language to any native of Ladakh."

We wish to add two remarks.

First, the existence of an apocryphal gospel written by some Buddhist hagiographer as a blending of Christianity with Buddhism is by no means impossible, yet, if such a book were found, it would possibly contain many traces, not of Mr. Notovitch's religious views, but of peculiarly Buddhistic tenets; and among them

the most prominent ones would be those of the sect to which the author of such a gospel had belonged. In addition it would misrepresent Jewish social conditions in a different way from Mr. Notovitch's life of Issa, as a Buddhistic author would color the report with the notions of the social conditions in which he lives. Should such a manuscript be found it would naturally, as does Mr. Notovitch's manuscript, represent Issa as having acquired his wisdom in India, but this, of course, would be poor historical evidence to prove that Jesus really had travelled to India.

Secondly, we have to say, considering the popular interest taken in the affinity of Buddhistic with Christian ethics, and the prolific exuberance of theosophic literature, it is strange that no one ever attempted, before the appearance of Mr. Notovitch's booklet, to invent a story which in the shape of a novel, or otherwise, would provide the public with a Buddhistic-Christian gospel, such as many people would like to see.

Mr. Notovitch's book, we repeat, is curious and interesting; but the reader who has not his grave doubts as to the authenticity of the manuscript of the life of Issa, must be possessed of an unusual amount of naiveté. Whatever may have been the author's intention in writing the book, he did his work most ingeniously, for the very crudeness with which he urges his claims is well calculated to captivate the crude taste of the masses who would remain unaffected by a more refined and historically more probable production. Had the manuscript of the life of Issa been written with a better historical knowledge of the past, it would undoubtedly have failed to interest the masses whose attention can be captivated only by a literature which anticipates their wishes and reproduces their own thoughts. Goethe says:

"Darf man das Volk betrügen?
Ich sage nein!
Doch willst du sie belügen,
Mach's nur nicht fein."

P. C.

BOOK REVIEWS.

HISTORY OF MODERN PHILOSOPHY, from Nicholas of Cusa to the Present Time. By *Richard Falckenberg*, Professor of Philosophy in the University of Erlangen. Translated with the Co-operation of the Author, by *A. C. Armstrong*, Jr., Professor of Philosophy in Wesleyan University. New York: Henry Holt & Co. 1893. Pp., xv and 655. Price, $3.50.

The appearance of Falckenberg's *Geschichte der neueren Philosophie* in an English dress supplies a welcome addition to the facilities for the study of modern philosophy. The aim of the work as stated by the translator in his preface, is "to be at once scientific and popular, standing midway between the exhaustive expositions of the larger histories and the meagre sketches of the compendiums." The book itself will bear witness to the unusual degree of success which has attended the execution of this purpose. Dr. Falckenberg has been peculiarly well qualified by his experience as a teacher, as well as by his extensive and accurate acquaintance with the history of modern philosophy, to produce a work that combines, in convenient compass, an adequate presentation of the outlines of modern thought, with practical adaptability to the requirements of students in the class-room.

The leading features which distinguish Falckenberg's work are the following. *First*, its treatment of the transition from Nicholas of Cusa, the "path-finder" of modern philosophy, to Descartes, its real founder, in a section which is not only very important in itself but also serves as a valuable introduction to the movements which follow. *Secondly*, its style, which is a model of compactness and perspicuity, being almost entirely free from that obscurity and involved phraseology which is so common in German philosophical writers and so perplexing to English readers. The influence of such masters as Kuno Fischer is here quite manifest. *Thirdly* its intelligent and sympathetic treatment of English thought. Schwegler set the bad example which most of the Germans have followed, of regarding English thought as a kind of side issue and giving it but cursory attention. Falckenberg, on the contrary, belongs to that group of contemporary German writers who have awakened to the fact that there has been a real movement of English thinking and that it possesses great historic importance. An English reader might not fully concur

in his estimate of Bacon, for example, but he could find little to criticise in his full and intelligent treatment of Locke, Berkeley, and Hume, the English deists and moralists and the representative thinkers of the eighteenth century. No other German, in a work of the same size, has treated the movement of English thinking so fully or with more intelligent appreciation. A *fourth* characteristic which is a distinctive feature of the work, is its thoroughly objective method, Falckenberg aims to be a simple interpreter of systems and movements, keeping his own subjective opinions in the background and using criticism as sparingly as possible. Such a method has its limitations, of course, and there is room for honest divergence of opinion as to the extent, for example, to which the historian may go in the employment on abdication of the critical judgment. The advantages of the objective method as conceived by Falckenberg, are, however, too apparent to require specification; and his employment of it, his manifest impartiality and his clear and masterly expositions, will tend to disarm criticism.

The work with which this treatise of Falckenberg's is likely to be brought into the closest comparison, is that of Windelband which has also been favored with an English dress. But the two works occupy different places. Windelband is specially adapted to the requirements of advanced students and presupposes that elementary acquaintance with the contents of systems and historic movements which is so admirably supplied by Falckenberg. Falckenberg's treatise will hold a place of its own as the best accessible historical *Einleitung* to the study of modern philosophy.

The translator has performed his part with conscientious fidelity and with marked ability. Enjoying exceptional facilities for his work, he has succeeded in making into excellent English a very faithful reproduction of the original. Professor Armstrong, like the author, is an experienced teacher and has been guided in his labors by the same sense of the practical needs of the class-room. An important addition which appears in the English version is found in the chapter on philosophy in Great Britain and America which has been completely re-written and greatly enlarged. Some other changes of minor importance have also been made. The work will doubtless be welcomed as an important addition to the text-book facilities for the study of philosophy in our colleges and universities. A. T. O.

BASAL CONCEPTS IN PHILOSOPHY. An Inquiry into Being, Non-Being, and Becoming. By *Alexander T. Ormond*, Ph. D., Professor of Philosophy in Princeton University. New York: Charles Scribner's Sons. 1894. Price $1.50. Pages, 308.

A note of high and noble seriousness pervades this work, which, differ from it how we will, strongly commands our respect and attention. The emphasis which it lays upon the religious problems of philosophy, the strong and determined stand it takes against the *faule Weltweisheit* of the day, the moderation and tone of its criticism, place it apart, immeasurably apart, from the flippant and intemperate productions of the period. "The masses of the intelligent are espousing agnos-

"ticism, not as the result of any reasoned conviction, *but out of sheer inability to "rise above the middle axioms of human thinking*. . . . The spirit of the time is not "lacking in scholarship or zeal for the truth: what it needs most is a fresh baptism "in the fountain of insight." "The greatest thought of the human spirit is the "thought of God." "The human soul is the highest actualisation of the spiritual "potence that is immanent in the world." Who would not give assent to the spirit of such utterances? In them Professor Ormond places his finger on the central problems of philosophy, and characterises clearly the fundamental defect of a great part of modern thought. Yet, having said this, we must say, too, that from his chief results, and especially from his *method*, we differ *in toto*.

Professor Ormond is a successor of Dr. McCosh and now occupies the chair of philosophy at Princeton. His theory is, broadly speaking, Realism. "The world is a "solid and firm-jointed reality which confronts the knower and fills his categories "with objective content from the beginning to the end of the process of experience." His method is the ontologic method ("ontologic" being understood here in its historical sense), and is diametrically opposed to the method of the Positive philosophies. Positive philosophy *goes up* from facts to abstractions; ontologic philosophy *comes down* from abstraction to facts. It sets itself such problems as these: "How does the Absolute become the Relative, especially the *Imperfect* Relative?" Answer, through Non-Being. In this art Hegel is the greatest adept. The extent to which Professor Ormond adopts this method may be seen from the fact that he regards Hegel's "restoration of the negative as a necessary philosophic datum" as a great stride in philosophy. He says: "The world is the *other* of Absolute spirit. ". . . In going out from itself it *others* itself, and this other is its negative or not-self. "The not-self is the world, and thus the world and its process are mediated by ne- "gation."

The universal complaint of German philosophers, says Heine, is *das Nichtverstandenwerden*, "not being understood." "Nur einer hat mich verstanden," said Hegel plaintively on his deathbed, "Only one man ever understood me," and, as the appalling implications of that confession dawned upon him, he turned and added in his last gasp, "*und der hat mich auch nicht verstanden*," "and he didn't understand me *either*!" Yet it would be wrong, from Heine's witticism, to suppose that Hegel's work was all for naught in the history of philosophy.

We shall now quote a few passages which will show what Professor Ormond's theory of knowledge is. He says: "Knowledge is founded in categories, and its "successive stages arise not primarily, out of the generalisation of facts, but rather "out of the emergence of new categories under which our generalisations are to pro- "ceed. We not only generalise facts, but our reflexion rises from categories of space "and time to those of substance and cause, and only rest finally in the supreme "ideas of unity and ground." In another place: "Self-consciousness is the first "principle of knowledge." And again: "The psychological categories must be "translated from subjective to objective universals.

The main motive of the volume is "a desire to restore the primacy of certain "conceptions which are in danger of disappearing from our modern thinking." Dissenting from monistic pantheism on the one hand and from agnosticism on the other, the author has sought in laudably small compass to reconstruct philosophy "upon the trinal categories of being, non-being, and becoming." Of the whole inquiry the aim "has been to penetrate the mysteries of the Absolute only so far as may be "necessary in order to discover how it rationally grounds the relative order." With respect to religion, we have as data, "(1) a transcendent Absolute whose energy "functions creatively in the world as an immanent spiritual principle or potency; (2) "the human soul a spiritual principle passing perpetually from potence to actuality "and thus epitomising the world-progress from mechanism up to actualised spirit: "(3) the logos which functions immanently as man's ideal law-giver and transcen- "dently as the organ of divine communication to the human soul."

Being, Non-being, Becoming, the Absolute, the Negative, the Logos, the a-Logos—such are the conceptions whose primacy Professor Ormond wishes to restore. Students who are unaccustomed to the symbolism of the ontological school will find this book difficult and baffling reading. But Professor Ormond expresses the hope that "the discerning reader will penetrate the shell to the kernel that it conceals." We hope that in a second edition of the work Professor Ormond will add an index, or at least an analytical table of contents. T. J. McC.

THE SCIENTIFIC STUDY OF THEOLOGY. By *W. L. Page Cox*, M. A. London: Skeffington & Son, 163 Piccadilly, W. 1893. Pages, 180.

It will be interesting to examine the views of a vicar of the Church of England, who prefaces his work with the words of St. Paul: "Prove all things, hold fast that which is good"; for we should expect much of enduring value from the work of a man who, though he adopts a scientific criterion of truth for religious researches is yet inclined by calling and by nature to do justice to the historico-religious beliefs of humanity. In examining first why "theology should be studied as the other sciences are studied" Mr. Cox finds that the modern disturbance of faith is not due so much to the apparent collision of the doctrines of religion and the truths of science, as to the fact that the doctrines of religion are supposed to lie for the most part outside of the scope of a strictly scientific inquiry. This, he contends, is not so. Theology is just as much a legitimate field of scientific research as are the other departments of knowledge. The trouble hitherto has been that theologians have doggedly adhered to exploded methods whilst scientists have studied the subject chiefly with implements which are not perfectly adapted to the ascertainment of truth in this province. Having overthrown the arguments of the dogmatists, having undermined their positions, the scientist has not yet established the real truth. Apart from all controversy, unprejudiced people will admit that the impugned articles of Christian faith do represent in some measure the actual teaching of Christ, that they have inspired the purest morality that has been exhibited on earth, and all re-

ligiously minded people must feel that somewhere the process of reasoning is defective by which it is contended that the fundamental articles of the Christian faith are unworthy of belief. The fact is, that the scientists who have studied this question have not studied the question "scientifically," and have rejected certain classes of truths which are of the very essence of the subject. One party places too much emphasis on one side of the question, the other on the other. The best hope of final agreement about the subject-matter of religious belief is to be looked for in the adoption by all of a common method of inquiry. This reform must come from theologians who have nothing to lose and much to gain by coming down from their high standpoint of authority and *a priori* reasoning. The work must be done by them and not by hostile hands. Theology must be made a science in the truest sense of that word, exactly as ethics has been made a science. But it may be objected that theology relates to God, and hence its subject is without the range of human observation. This, however, only shows the difficulty of the science, and not its impossibility. Theology, Mr. Cox contends, deals with a class of facts which are only discernible and appreciable by those whose intelligence is illuminated by purity of heart. By inductive reasoning it can be proved that the "things of the spirit of God" ought to be "spiritually judged." Certain facts concerning the nature and will of God are only ascertainable in the first instance by those in whom high intellect is combined with high character, to whom sources of knowledge are opened to which men of less mental elevation cannot penetrate.

It may be interpolated, that this view, true as it undoubtedly is, is exactly that which led to the present state of things in the ecclesiastical world. It is the argument, which most theological philosophers and churchmen use; it is the organon for the discovery of God which Professor Knight sets up; and it is the "illative sense" of Cardinal Newman by which the whole Roman Catholic theology is justified. But it is scarcely more true in theology than in other fields. Even in exact science, profound instinct and rich experience are necessary for great discoveries. By its admission, too, there is almost as much danger of the engenderment of authoritative scientific guilds as there is of the creation of infallible ecclesiastical authorities. But every one will see that between the two cases an absolute comparison is not to be made. The world of gross natural facts is always at hand, and definite decisive experiments can be performed upon it at any moment. But experiments decisive of the laws of ethics and theology take generations and generations, nay, even centuries. When it is reflected, as Gauss intimates, that even the foundations of dynamics were *historically* verified, we shall not be surprised that the important and necessary truths of the difficult domain of ethics and theology must wait ages for their scientific establishment.

The following, according to Mr. Cox, are the points upon which students of religious truth ought to arrive at some consensus of opinion: (1) That statements of the Bible concerning scientific matters should be treated exactly in the same way as similar statements in all other books; for example, the Genesis account of the origin

of the species; the stopping of the sun in its course, although here Mr. Cox makes the fine distinction that the question is whether God ever *did* make the sun stand still, not whether he *could* make it stand still. It seems to us that the best scientific decision of this question is the view of the Hindu philosophers, namely, that even God himself is not superior to his laws. (2) That questions of literary and historical criticism must be freed from the embargo of authority; for example, the authorship of the books of the Bible is not to be predetermined, etc. (3) That in the investigation of the subject-matter of religious belief very high authority is to be attached to the opinions of men of the most approved wisdom and the most conspicuous purity of life. Religious truth has always been brought to light not by mere students and philosophers, but by men who have had a peculiar power of discerning it. It has not been reasoned out but "seen." Here, again we have the "illative sense" which leads up inevitably to revelation. (4) Doctrines and dogmas may be legitimately examined. (5) That faith is a legitimate factor in the building up of a personal belief in doctrines which clearly only lie in the region of the probable. (6) That questions of religious rites and ceremonies must be decided by the test of propriety and utility. (7) That the theologian should be open-minded, conversant with all sciences, unprejudiced, and sincere.

In the second, third, fourth, fifth, and sixth chapters of the book, Mr. Cox shows what conclusions are likely to be arrived at by an application of the scientific method to some of the articles of Christian belief most controverted, namely, God, immortality, the miracles, and the principles of worship. With respect to God, his method leads to the usual conclusion of science, best expressed in Matthew Arnold's words: "A stream of tendency that makes for righteousness," or the power which compels obedience to its laws on pain of destruction. We have no data for making positive statements about the essential nature of God, yet "His nature is in every respect higher than that of man." We speak of Him in terms of personality because otherwise we could have no satisfactory religious relations with Him. But to pray to Him, and prayer is claimed to be necessary, we must address ourselves to Some One, a Father. In other words, it can be scientifically proved that there is a solid substratum of fact underlying the doctrine of the Christian church concerning the fatherhood of God, the divine providence, and the efficacy of prayer. In fact, Mr. Cox's position here seems to be, that we must not dogmatise about such matters, but that we cannot help dogmatising a little bit about them. We are led also by a process of scientific reasoning to see a triple manifestation of God: (1) in nature and the laws of nature; (2) in perfect humanity; and (3) in the higher impulses which act upon men, although for all we know there may be more manifestations; but the Christian church has done invaluable service in popularising this truth by its doctrine of the trinity in unity. Of course, the idea of the trinity must be purified of its absurd theological subtleties. But trinitarianism is no more a dogmatic system than unitarianism. Mr. Cox's exposition of this idea is well put and deserves the attention of unthinking scorners of the trinity of God.

When he comes to the question of future life and of miracles, Mr. Cox seems to overlook the principles which he laid down in his first chapter or at least not logically to apply them. He first finds that science can affirm or deny nothing with respect to the future life of man, therefore we must decide it upon some other kind of evidence, different from that which is supplied by the physical sciences. That other kind of evidence is what has always been adduced here: the momentousness of the question, which inclines us to reckon upon so blissful an uncertainty, be it ever so small; the insight of poets and seers; the testimony of the common consciousness of humanity; and lastly, but chiefly, the utterances of Christ, "whose pronouncements are of the nature of positive proof." Mr. Cox's attitude here is very strange. He says, it is in the highest degree unscientific to assume the negative of so profoundly important a question. But how about assuming the positive of it? If the question is scientifically unanswerable, then a scientific theology should not attack it; in its unanswerable form it is not a true scientific problem, but should be restated as the problem of God has long since been restated, and answered in some such way as that was answered by the author.

It is the same with the question of miracles. It is almost incredible that an author, who states that "Moral truth and religious truth are to be proved, just as "truth of physical science is to be proved, by observation and experiment and, "when necessary, by correct logical argument; a new 'revelation' is like a new "scientific theory; a man promulgates a new doctrine in morals or theology, just "as an observer of facts in nature promulgates a new doctrine concerning the cor-"relation of those facts,"—could yet ultimately give a rationalistic explanation of miracles. How different from this is Mr. Cox's attitude on the question of worship, where it is his belief that "to hold frequent communion in spirit with the "Infinite Ruler of all, and to live in dependence on His power and goodness and in "obedience to His laws, are the only absolutely indispensable conditions of render-"ing to Him that worship which is His due." Upon the whole we must say, with all due respect for the author's unusual abilities and logical powers, that Mr. Cox has not, on the questions of future life and miracles, consistently carried out the scientific declarations of his premises.

T. J. McC.

DIE SÂMKHYA-PHILOSOPHIE. Eine Darstellung des indischen Rationalismus nach den Quellen. By *Richard Garbe*. Leipsic: H. Haessel. 1894. Pages, 347.

Considering the fact that Buddhism has sprung from the Sâṃkhya philosophy, it is to be anticipated that the present work, which is the first attempt at giving a systematic exposition of its nature, history, and tenets, will meet a widespread demand, not only among scholars, but also among the public at large. Professor Garbe, the translator of the most important Sâṃkhya texts, is of all our Sanskrit scholars pre-eminently fitted to be the interpreter and expounder of the Sâṃkhya system, and indeed this work of his brings his former historico-philosophical labors

to a certain consummation, showing them in their importance, and allowing us to understand the plan of his studies.

The Sâṃkhya philosophy, founded by Kapila, is closely connected with Buddhism. The Sâṃkhya philosophy is the mother of Buddhism, and Buddha has derived from it many of the fundamental teachings of his religion. Many terms, and the solution of many problems, were adopted by Buddha without essential change. Especially the four noble truths are plainly foreshadowed in the Sâṃkhya philosophy. Both the Buddhist and the Sâṃkhya philosophers hold that life is suffering, and that efforts must be made to deliver us from the evil of suffering. The contents of the Sâṃkhya doctrine has been formulated in the following four tenets: (1) what one must deliver oneself from is pain; (2) deliverance is the discontinuance of pain; (3) the cause of that from which one must deliver oneself is a lack of discrimination, which is based upon the connexion of the soul with matter, and produces pain; (4) the means of deliverance is the discriminating cognition. Not only the method of stating the problem of the deliverance from evil under four heads, but also the very formulation of these four sentences have, to a great extent, been retained in the Buddhistic terminology. Nevertheless, a great change is noticeable from Kapila to Buddha, and indeed it is a change for the better. It is a progress of paramount importance. Says Professor Garbe, on page 143: "The "original Sâṃkhya doctrine declares even good works do not enhance but hinder the "attainment of the discriminating cognition (which is the means of salvation). Ac- "cordingly, nothing is said in the Sâṃkhya system of morality, and this want has "been supplied by its daughter-system, Buddhism, in the most admirable way,— "and in an impartial consideration we must not conceal the fact that the original "Sâṃkhya philosophy, which contributed much to the mental equipment of Indian "thinkers, must have played a certain part in the unfavorable development of the "Indian national character. Even in some passages of the text-books of the system "a morally pernicious influence is perceptible."

Professor Garbe presents the Sâṃkhya philosophy in uncolored objective exposition without criticism and without comparisons with similar ideas of European philosophy, and this method seems to be the proper one, because we must first have the facts clearly stated before we can use or apply them. By drawing parallels too soon we shall only be bewildered, and misunderstand the peculiarly Indian spirit of the various Indian thinkers.

Professor Garbe's book is divided into four parts. The Introduction contains four articles of general interest on the Sâṃkhya philosophy, its history and literature, its connexion with Greek philosophy, and a survey of the other philosophical systems of India. The second part characterises the Sâṃkhya philosophy. The name is derived from *sâṃkhya*, number, and is usually explained as a numeration-philosophy, that is, as a system of thought based upon exact distinction, measuring and counting. Professor Garbe considers this explanation as an after-thought, and believes that the name was originally a nickname invented by its enemies, the Brah-

mans, who intended to ridicule the method of numeration, for the Sâṃkhya philosophers show a special preference for reducing abstract concepts to dry enumeration. The world-conception of the Sâṃkhya philosophy is a consistent pessimism. All life is suffering, and the happiness which our experience appears to afford does not exist in reality. The worst suffering, however, consists in the necessity of a constant repetition of old age and death in every renewed existence. This is the nature of saṃsâra, of which we read (page 133):

"All living beings without distinction are suffering the pain produced by old "age and death. All are possessed of the worm, which is the fear of death, pre- "senting itself as the wish, 'may I not cease to exist, may I live,' and anything "which creates fear is pain; therefore, death is pain."

The aim of the Sâṃkhya school is a perfect annihilation of pain. Here the various methods of overcoming pain are refuted. The materialist hopes to free himself from bodily pain by medical treatment, from mental pain by all kinds of enjoyment, and protects himself against evil influences from supernatural sources by the use of magic. All these means are rejected by the Sâṃkhya philosophy as insufficient. They do not insure certainty, and afford only a transient relief. The Brahman religion offers sacrifices as the best means of escaping pain, and of attaining a place in heaven after death, where all pain will be at an end; but the Brahman receives the same answer as the materialist. His means are insufficient. Rituals are of no avail, and sacrifices are often impure, for they imply the shedding of blood; and the slaughter of animals involves us under all circumstances into guilt, which, according to the law of retaliation, will produce pain. Moreover, rich people can indulge in religious sacrifices, while poor people cannot. Thus, the poor are excluded from the methods of salvation offered by the materialist as well as the Brahman. No less vain are the hopes of the Yoga practice, to attain salvation by acquiring supernatural powers. Deliverance must not only free us from pain, but from its cause, and must make its return forever impossible. Now, since pain lasts only so long as the soul is in connexion with bodies and organs, salvation can obtain only if the migration of the soul is finished. And this goal, the absolute discontinuance of pain, can be reached only through philosophy, consisting in the discrimination between soul and matter.

Many constituent parts of the Sâṃkhya system are common to all other Indian philosophies. These are especially the ideas of saṃsâra and deliverance, which are treated on pages 172–184.

A peculiarly interesting feature of the Sâṃkhya philosophy is its pronounced atheism. While the existence of the national gods of India are not denied, the idea of a personal world-creator is most emphatically rejected. The mythological gods are not regarded as eternal beings, but as individuals who have their own karma and merit, who have originated and will pass away. There is probably a purpose in distinguishing between the devas, that is, the national gods of India and Içvara, the powerful, the Lord, meaning a personal world-creator. The belief in the former

is not interfered with, while the belief in the latter is rejected on physical, logical, and moral grounds. Sâṃkhya atheism is based, first, upon the doctrine that unconscious matter acts with intrinsic necessity according to the forces which it contains; secondly, upon the consideration of the law of karma which prescribes the course of the activity of living beings; and among other reasons we find, thirdly, that the problem of the origin of evil appears insolvable upon the assumption of theism. Professor Garbe quotes on pages 192-193 passages from the Kârikâ 57, and the Vijñânabhikshu, VI, 65, which do honor to the subtle thought of old Indian thinkers, and which will not be easily replied to even by our modern theologians.

The third part contains the doctrine of matter, consisting of chapters on cosmology, the reality of the phenomenal world, the attributes of matter or the three gunas, the evolution and reabsorption of the world, the concept of causality, the products of the fine and the crude elements. We need not mention that the old Sâṃkhya philosophers had not the slightest idea or correct knowledge of the physiology of the human organism. Their physiological knowledge is rather an *a priori* construction of what the organs of the soul might be than a real description of facts. The Sâṃkhya philosophy distinguishes between the *buddhi* or the reasoning organ, the *arhamkâra* or the ego-creator, the *manas*, or the internal sense. Besides these three there was the notion of an inner organ of unity. Besides the external senses there were thirteen organs which were supposed to hold an intermediate position between the purely psychic and bodily sense-activity. The material body consists of crude matter, and is doomed to perdition at the moment of death. There is another, more sublimated body (not unlike the astral bodies of theosophists) which is supposed to survive death. This sublimated or inner body is supposed to accompany the soul in its transmigrations, and it, too, partakes of the *samskâras* or dispositions produced by merit and demerit. Every process impresses an analogous vestige into the soil of the thought-organ, and this vestige continues as a germ in the ground, and constitutes a disposition or *samskâra*, that is, a preparation or readiness for future reproduction of this process. These dispositions form in their illimitable mass an essential attribute of the thought-organ. The thought-organ is actually colored by them, so various are the innumerable dispositions which during the course of many births have acquired citizenship, usurping it according to the irrefragable natural law to which the individual is subject. These dispositions remain a constant property of the individual, conditioning the functions indispensable for physical life, the habits and talents which we, as we say, bring with us into the world, all of which are the heirloom of former births. They are impressions which in the meantime continue to exist and preserve their latent power, ready to manifest themselves whenever needed, like seeds which have been stored away for years, but as soon as brought into favorable conditions sprout with the same vigor as if they had just been harvested. We do not remember our past destiny of former births, as their impressions are without consequence in their present existence, and they can never be lost.

The last part is devoted to the doctrine of the soul which constitutes the dualism of the Sâṃkhya system.

Professor Barthélmy in his *Première mémoire*, pp. 449–450, does not understand how Kapila, according to the Sâṃkhya system, could retain the conception of the soul as perfectly inert, and here Professor Garbe replies that Kapila's soul-conception was invented to explain consciousness. The *buddhi* is said to be purely material, not less than bodies and other objects; it is also an object. The soul, however, produces the various attitudes of the inner organs by consciousness, by merely being near and throwing light upon their conditions. How much akin this view is to some modern conceptions of the soul, which insist upon the passivity of consciousness, need not be mentioned. Kapila's dualism of the distinctness of the soul leads him into the doctrine of the plurality of souls, which makes his system involved and naturally led to the criticism exercised by his successor, Buddha. Buddha went so far as to deny the existence of the âtman, considering the soul as the continuity of many mental acts, thus leading again to a monistic conception.

Deliverance could be attained only by a discontinuance of the effect of the objects upon the soul. Deliverance could not be conceived as a reabsorption of an individual soul into a divine soul, because, according to the Sâṃkhya system there is no God, and if a God existed, such a deliverance would be furnished solely because of the law that every combination leads to separation. Further, deliverance cannot be the annihilation either of the soul or of the world, because experience teaches that the aspiration of man seeking deliverance is not directed toward annihilation. All this is not deliverance. But what is deliverance? According to the explanation of Aniruddha it is an indescribable condition in which all pain is done away with, excluding the possibility of its return. But since pain is supposed to originate through the connexion of the soul with matter, deliverance consists in the perfect separation of both in a definite isolation of the soul. This separation means that any pain which affects the inner organ has ceased to throw its reflex upon the soul, or, to use another expression, that the organ affected by pain is no longer illuminated by the light of the soul, by consciousness. The soul continues in its state of deliverance as an individual being, but it exists in a state of absolute unconsciousness. Doubts as to the possibility of such a state are refuted by calling attention to such conditions as dreamless sleep, coma, or trance, in brief, all states in which consciousness disappears; the main difference between these states and deliverance being that they still contain the germ of being bound to material existence, which does not obtain in deliverance.

In the Introduction Professor Garbe puts forward a theory of the un-Vedic origin of the Sâṃkhya philosophy: not only because Kapila's doctrine was heretical and contradictory to the Vedas, and unknown in the Vedas, but also because none of its fundamental tenets are found in the Vedas. These tenets are the absolute disparity of the spiritual and material principles, the multiplicity of souls, the independence and eternity of matter, the view that matter consists of three constituents, the *sat-*

tvas, or goodness, the *rajas*, or badness, and the *tamas*, or indifference; the unfoldment of the world from primitive matter; the conception that first the psychical organs and then the outer objects originate; the trinity of the psychical organs, the twenty-five principles, the doctrine of the sublimate elements, and the inner body of the dispositions or saṃskaras; the conception of psychical processes as primarily purely mechanical, and only raised into consciousness by the spiritual power of the soul; the denial of the existence of God, and finally the proposition that deliverance is possible only by distinguishing spirit and matter. None of these ideas, Professor Garbe states, can be found in the Brâhmaṇas and in the Âraṇyakas. These, in brief, are his arguments to substantiate his claim of an un-Vedic origin of the Sâṃkhya philosophy. His arguments, however, do not appear to us sufficient, for how often do new ideas originate by contrast, by combination, or through the suggestion of the untenability of the prevalent ideas. Thus, Kant's philosophy has, as we most positively know, its roots in Wolf and Hume. Nevertheless, if we enumerate Kant's fundamental doctrines we shall find none of them in the works of those philosophers from the study of which he received the strongest impulse to their formation. Thus, in the face of the facts enumerated by Professor Garbe, we still regard a Vedic origin of the Sâṃkhya philosophy as possible, and if it were not so the mystery of its origin would be greater than before. For, not knowing at that time any higher civilisation than that of the Brahmans, how shall we account for the origin of this original and most independent philosophy of ancient India among those foreign invaders? Whatever be the truth regarding the home and origin of the Sâṃkhya philosophy, it remains the most thoughtful dualistic system of India, and, apart from shortcomings due to the lack of natural science, perhaps of the whole world. The present volume is unquestionably a very scholarly and reliable exposition, and, as such, an indispensable handbook for students of Indian lore, and especially for those who are interested in the origin and development of Buddhism. κρς.

RELIGION INNERHALB DER GRENZEN DER HUMANITÄT. Ein Kapitel zur Grundlegung der Sozialpädagogik. By *Paul Natorp*. Freiburg and Leipsic: F. E. B. Mohr. 1894. Pp. 119.

The title of this booklet is apparently modelled after that of Kant's *Religion innerhalb der Grenzen der reinen Vernunft*. Prof. Natorp, accordingly, has the same enemies to contend with as did the sage of Königsberg; on the one side those to whom religion is higher than all understanding, and on the other hand those to whom humanity is too high an ideal to be identified with religion—an extramundane Utopia. The author states in the Preface that it is his proposition to conciliate both antagonists, trusting that religion should be applied to practical life, especially to the social problem. A radical question demands a radical answer; in a word, it demands a scientific method. The Open Court Publishing Company was founded for the purpose of establishing the Religion of Science, and so of reconciling religion with science by applying the religious enthusiasm to the practical problems of life and

solving its theoretical problems by the method of scientific inquiry. Therefore, we need not say that the enterprise of Professor Natorp finds our full sympathy, and we hope that his work will prove good seed bringing forth in time much fruit.

Like Kant, Professor Natorp contends that the laying of the religious conflict cannot be decided by an appeal to traditional authority or to sentiments and pious instincts. The *is* and the *ought* are in conflict, but our sentiment imperatively demands a solution of the conflict. It would be sad if there were an impervious abyss between willing and doing, between duty and action. We must have the faith for achieving that which is required. By faith Professor Natorp understands not the vague idea of belief, but staunch confidence, the firm trust that this demand is for every man, to a certain degree at least, realisable. Accordingly, he proposes to raise all mankind to the height of humanity, to educate the people, that is, the mass of the laboring classes, to the highest attainable stage of a scientific, moral and æsthetic civilisation, in the consciousness of their social relations, or, as our author expresses it *in Gemeinschaft, durch Gemeinschaft, als Gemeinschaft*. His religion will not be dogmatical, but an aspiration to attain the ideal of humanity. The ideal of humanity to be recognised by a more and more complete investigation of the truth. He says on page 105:

"Often it has been said that a non-dogmatic religious investigation is impos-
"sible, but I do not know on what grounds. The child takes the religious tales
"simply as history, not in a scientific but in a naïve sense. He is first kept busy in
"acquiring its contents and has no time to reflect whether the events really took
"place and are to be understood literally. Supposing that everything is clear and
"natural—the child-imaginations of mankind are always comprehensible and vivid
"to a child's imagination—supposing again, that the moral is not crude and of-
"fensively intrusive, but steals into the soul on the quiet and sure path of imagi-
"nation and sentiment without provoking reflexions: the question will not rise at
"once, Is the story true indeed, or is it only a beautiful fairy tale? Should, how-
"ever, the question arise,—and certainly the stage will come where a child will
"either propose it himself or in case it be proposed understand its deep importance
"—then let the teacher say clearly and definitely: it has been handed down thus by
"tradition and received *bona fide*. Many thousands have been convinced and find
"happiness in this conviction; perhaps the teacher himself, but he ought to add there
"are many faithful people who are not thus convinced. No doctrine concerning
"these things has any right to demand of you the conviction that it is literally true.
"You will have to decide independently for yourself as soon as you have learned
"many more things whether or not you will accept it. Then, however, as the main
"thing the teacher should reveal the great moral truth which is contained in the
"story, and should make it as impressive as possible. There are a great number of
"educators, and they not the worst, who would be happy to be allowed to teach re-
"ligion in this way."

Professor Natorp proposes this method not for the higher schools or universi-

ties, but for the schools of the people, of the children of laborers. He demands, first, history of religion, expounded in a strictly objective way, as all history ought to be treated, and then an explanation of the foundations of religion which are given in the nature of man, in the laws of his consciousness of his moral and social being. It will produce an unprejudiced appreciation of religion as one of the most potent factors in the education of mankind. This method would resume, as says Professor Natorp (page 107), the good traditions of the German *Aufklärung*, which should never have been abandoned. Prof. Natorp's work unites with high ideals of reform, the conservatism of the serious philosophical inquirer. κος.

THE APOLOGY AND ACTS OF APOLLONIUS AND OTHER MONUMENTS OF EARLY CHRISTIANITY. Edited with a General Preface, Introductions, Notes, etc., by *F. C. Conybeare*, M.A., Late Fellow of University College, Oxford. London: Swan Sonnenschein & Co. New York: Macmillan & Co. 1894. Pp. 360. Price $3.50.

The Acts which form the contents of this work are translations of ancient Armenian texts selected from a repertory of martyrdoms published at the Armenian monastery of San Lazaro, in Venice, in the year 1874. It is their object to give the reader, "in a succession of vivid pictures or glimpses, an insight into the practical working of Christianity during the first three centuries of its history." It is known that the documents of early Christianity were continually being altered and recast to suit every fresh development or change in the views of the orthodox and heretical believers. Such changes were made regularly in the Latin, Greek, and Syriac versions, but not so much so in the Armenian versions, which accordingly often give us access to a more primitive form of Christian writing than has survived in Greek, Syriac, or Latin.

Highly interesting is the knowledge these Acts afford us of the character of early Christianity. All relate to martyrdoms. We must not suppose that the highest temper of the new religion was displayed there, but must expect simply a life-picture of the times, sketches of the battle for freedom of individual conscience and private judgment as opposed to the tyranny of a despotic government and the superstitions of the people. We see here clearly, also, the attitude of the government to the new sect. "From the time of Domitian, if not at a still earlier date," says Mr. Conybeare, "the very name of Christian exposed a person to the penalty of death." We also get a glimpse of the pagan elements which still survive in the conceptions of the converts. Nothing could be more untrue than to suppose that conversion to the religion of Christ signified and brought with it a disbelief in the gods of paganism. "A convert continued to believe in the gods as firmly as before; the only difference was that he now came to regard them not as benevolent beings but as malevolent ones. They were the fallen angels, ministers of Satan, lying in wait to destroy men, and often for that end taking up their abode in and disguising their natural foulness

under the most beautiful statues." Even in Justin Martyr, and in Augustine we meet with these views, and we are not astonished, therefore, to find that the Christian saints resorted to exorcism against the gods of the heathen. Further, this view led to iconoclasm, another general characteristic of the early Christians. "The obvi-"ous way of scotching a foul demon was to smash his idols; and we find that an "enormous number of martyrs earned their crown in this manner, especially in the "third century, when their rapidly increasing numbers rendered them bolder and "more ready to make a display of their intolerance. . . . The most popular of the "saints were those who had resorted to such violence and earned their death by it; "and as soon as Christianity fairly got the upper hand in the fourth century, the "wrecking of temples and the smashing of the idols of the demons became a most "popular amusement with which to grace a Christian festival. As we turn over "the pages of the martyrologies, we wonder that any ancient statues at all escaped "those senseless outbursts of zealotry."

We find also in many of these martyrdoms that the creeds of the saints are simpler than in the third century Acts, showing a distinct growth of doctrine; and also, contrary to the professions of many modern divines, that all the saints believed in the eternal fires of hell,—a belief which Christianity took over from paganism. Without the dread of death and the belief in the eternal fire of hell which pervaded the minds of all the ancient peoples, it is probable that Christianity would not have made much advance towards the conquest of men's minds.

Interesting is it also to note how the ancient myths remained gathered around the early saints. Callistratus is borne to the shore by dolphins like Amphion, and saints innumerable began their careers by destroying a dragon like Perseus, or like Hercules a voracious lion, or like Theseus a destructive bull. "A rich harvest awaits any student of folk-lore who approaches the legends of the saints from this point of view." It is also to be stated that the early Christians did not renounce the world as much as is usually supposed from some classical examples of detachment from mundane interests. We find, too, that the asceticism of the earliest followers of Jesus and Paul was due to the conviction that the end of the world was at hand; the millennium belief still survived in some remote regions, as in Syria and in Pontus. We see, thus, that Jesus's repudiation of marriage like the companion precept to possess no riches, was originally meant to prepare men for the kingdom of heaven which was at hand, and we discover why it is that the belief in the superior holiness of virgins survives in the church.

Such are a few of the inferences concerning early Christianity that may be drawn from this work. Of all the Apocrypha here translated, the most beautiful is the Acts of Paul and Thekla, which are full of humane touches. But every one of the Acts of this collection is well worth reading by persons who have the least interest in this subject. It is unnecessary to say that Mr. Conybeare's translation is forcible and idiomatic.

μκρκ.

MATTER, ETHER, AND MOTION. The Factors and Relations of Physical Science. By *A. E. Dolbear*, Ph. D., Professor of Physics, Tufts College. Boston: Lee and Shepard. 1894. Pp. 407. Price, $2.00.

The English-speaking world has little reason to complain of a dearth of popular treatises of science. To speak only of physics, nearly every master of that science has left some splendid and comforting memorial that the verified truths and accredited hypotheses of science, however dim or abstruse their origin, can, at some period of their development, be stated in plain and simple terms and be made intelligible to clear and unbiassed minds of all professions. Yet the example, the classical ideal, set by men like Faraday, is not always followed—not completely followed even by men of Faraday's approximate intellectual stature, and infinitely less so by spirits of a more subaltern cast. Addressing an audience in the main credulous, and prepared by long mistraining to expect and to accept only marvellous revelations, the popular expositor of science is exposed to temptations which yielded to, fully justify the stigma that cleaves to the literal English rendering of his title's French equivalent—the *vulgariser*. Frequently, a novelty, which discharges no function in the method or in the practise of science, is exalted to the dignity of a principle and treated with the impressive particularity which properly belongs only to important truths. Science, like society, has its fads. But the scientist, whose mental anchor does not drag, is perfectly aware that these erratic strayings of his thoughts do not constitute the serious business of his profession, and when he indulges in such cerebral antics, he usually does so with a consciousness and underplay of humor which from his point of view fully excuses him. But with the uninitiated, trustful public it is different. Here the mental excursions of the physicist only astound and mystify, and, being accepted as truths, convey an entirely wrong impression of what science is, and scarcely any of what it accomplishes.

Of no epoch of scientific development is this more true than of the present. Great as the advance of science has been in the last fifty years, so great indeed that with some liberty of expression the epithet "revolutionary" may seem justly applied to it, it is yet an exaggeration to say, with Professor Dolbear, that more *knowledge* has been acquired in this time than in all the preceding centuries (p. 384). In scientific freaks it does stand above all the preceding centuries, but, with the exception of three or four ideas, (which had their root in earlier thought,) the science of the epoch indicated is distinguished from that of the two preceding centuries by nothing more remarkable than an increased zeal in the domain of plodding specialised research. When the time for its criticism comes, it will not be said that the knowledge thus acquired "is in the nature of a catastrophe where old continents have sunk and new ones have arisen from ocean beds."

But enough of retrospect. The text-books have not kept pace with this revolutionary advance of science, and Professor Dolbear's book is written to meet the wants of a large body of persons who desire to know the contemporary state of natural philosophy and who have neither the time nor opportunity to read and digest

the thousands of monographs which record that advance. Really, the book is more than this. In a clear, smooth style, Professor Dolbear expounds the scope and import of the chief ideas of modern physics, as they take shape in his philosophy, and from his expositions the critical reader will derive much profit and stimulus. If he has not solved all his problems, he at least leaves the most of them in a shape which will make their solution easier for others. And this is much. More difficult than the solution, often, is the proper formulation of a problem. For, properly formulated, a problem sometimes turns out not to be a problem, and its solution is accordingly dispensed with.

Leaving aside the solid kernel of the work, we shall now simply advert to a few points on which Professor Dolbear's views may be criticised, first affixing here the titles of the chapters of the book, which are: "Matter and Its Properties," "The Ether," "Motion," "Energy," "Gravitation," "Heat," "Ether Waves," "Electricity," "Chemism," "Sound," "Life," "Physical Fields," "On Machines and Mechanism," "Properties of Matter as Modes of Motion," "Implications of Physical Phenomena," "Relations of Physical and Psychical Phenomena."

Professor Dolbear accepts *in toto* the mechanical view of the universe. First, all *physical* phenomena are reducible to the principles of mechanics, and atoms and molecules are subject to them as much as masses of visible magnitude; however different one phenomenon is from another the factors of both are the same—*matter*, *ether*, *motion*. "The visible universe may be conceived as a vast machine within which motions are being exchanged by contact and radiation." Matter is defined generally as anything which possesses the property of gravitative attraction. The existence of an ether is supposed, not asserting gravitative action, and hence different from matter, but in all probability *by some kind of a vortex motion* making up matter. As to gravity, there can be little doubt that the ether is concerned in it. "One cannot but see that it [the ether] is a storehouse of an almost unlimited "amount of energy of many kinds; so that if every particle of matter were in- "stantly annihilated, there would still be a universe filled with energy, though it "would not be serviceable, because lacking the conditions for transformation into "useful forms. This may be said to be one of the functions of matter—the trans- "formation of the energy it gets from the ether." Second, as to *vital* phenomena Professor Dolbear accepts the theory, which has the weighty advocacy of Haeckel and nearly all great naturalists, that the ultimate explanation of all biological phenomena must be mechanical. "It is clear," he says, "that the solution of every "ultimate question in biology is to be found only in physics, for it is the province "of physics to discover the antecedents as well as the consequents of all modes of "motion."

It is hard to go behind a mechanical explanation of vital phenomena, more so behind a mechanical explanation of physical phenomena. But although the opponents of the latter are few and isolated, the opponents of the former are not; and such passages as the following, supported though they are by eminent authorities, give a

wrong impression: "What seemed probable forty years ago, to those who were "conversant with the facts,—that vital force as an entity has no existence, and that "all physiological phenomena whatever can be accounted for without going beyond "the bounds of physical and chemical science,—has to-day become the general con- "clusion of all students of vital phenomena; and vital force as an entity has no ad- "vocates in the present generation of biologists. The term has completely disap- "peared from the science, and is only to be found in historical works." Applied to the old vitalism, this statement is true. But it overlooks a strong and important movement in biology and philosophy, which wrong or right, reactionary or progressive, still exists and even employs the name of vitalism. It is represented (in the scientific field) by Hanstein, Marilaun, Rindfleisch, and less mystically by Bunge and Binet. (See Max Verworn's article "Modern Physiology," *The Monist*, Vol. IV, No. 3, and the preface to A. Binet's *Psychic Life of Micro-Organisms.*)

We will next mention some of the implications of the new physical hypotheses in the inanimate field, and seize the opportunity of seeing how an hypothesis can throw light upon itself. According to Professor Dolbear we have in natural phenomena matter, and ether, and space, and time, and motion. "If matter and "ether be substances, then the product of one into the other would signify nothing; "it would be physical nonsense. So likewise would be the product of matter into "space or time; and yet if matter is to be possessed of energy, and motion is *not* "one of the factors, then either space or time must be, and no one can imagine "how energy can in any way depend upon time as a factor, and there is no degree "of probability that it is or can be so; and hence, though we had no hint of how it "might be, one would need to avow his belief that in some way motion was involved "in every case where physical energy was involved, for in any case where it had "been hitherto possible to trace it, it had been found to be present as a factor in "precisely the same relations as in all other known cases, and hence he would avow "a disbelief in the existence of potential energy in any other than a loose sense for "a condition where the character of the motion involved was obscure. This would "imply that all energy is kinetic, whether the character of the motion was deter- "mined or not. This view is now held by those who have taken the pains to think "out the necessary relations that are involved in this subject." It follows from this that potential energy must in some way depend upon motion (Tait). And, in another place, the conclusion is stated that *inertia, too, must be looked upon as probably due to motion.*

Again, since at absolute zero there is no cohesion, *hardness* cannot be a property of atoms; from another property of the absolute zero, *color* cannot be affirmed of atoms. "*An atom is a particular form of motion of the ether in the ether.*" Impenetrability is an unwarrantable assumption. Even "such differences between "*the atoms of the elements as are called their masses, are due to the relative rates* "*of rotation* [of ether within the ether]." The world is reducible to motion and ether, and by this explanation is rendered more mysterious than it was without the

explanation. "The mystery of phenomena is not lessened but made greater by the "discovery that everything which affects our senses in every degree is finally re-"solvable into a substance having physical properties so utterly unlike the proper-"ties of what we call matter, that it is a misuse of terms to call it matter."

When we reason from facts to facts, even such as are beyond the range of experience, we are pursuing science; when we reason from *assumptions* to facts beyond the reach of experience, we are pursuing metaphysics. Much of the new physical ontology suffers by this error. We should never forget that in following out to their logical conclusions the implications of the assumptions made or suggested by science regarding atoms and ethers and molecules, we are extending conceptions which are not based upon facts, and which are not always subject to experimental control; that we may be applying such assumptions to cases to which they do not belong, and so be doing in physics what the ontologists did in philosophy when they sought to deduce the world from the notion of Being, Non-Being, etc., etc.

With respect to the "absolute scale of temperature," this is simply a scale reckoned from a supposed point, where the tension of a gas is zero. If without the limits of experience things were the same as they are within those limits, that point would be $-273°$ Celsius. But, useful and convenient as this scale is as a scientific tool, it does not follow from it that a temperature-point is producible at which the tension of a gas is equal to zero, nor that a lower degree of temperature is impossible. Consequently, to accept that scale as absolute, in the absolute sense, and to juggle out of it the properties of matter, of atoms, or of ether, is logically inadmissible.

Professor Dolbear lays considerable stress upon his treatment of "physical fields"—all analogies of fields of force. We shall mention only one point here, which will reveal the author's attitude to the revelations of the new psychical sciences. As there is a magnetic field, an electrical field, a thermal field, etc., so, Professor Dolbear asserts, (on the ground of phenomena of sympathy,) there is a *brain-field*. His idea seems to be that there is such a thing as cerebral induction. Still, "this is not to be understood as asserting that . . . . thought-transference "actually occurs. All that is asserted is that the physical conditions necessary for "such transference actually exist, and one who was acquainted with the properties "of physical fields would certainly predict the possibility of thought-transference "in certain cases."

In the two last chapters of the book Professor Dolbear puts some very hard questions to the spiritualists. But he is lenient, after all, to their aspirations. We shall close therefore with a quotation which will show his attitude towards the momentous questions of modern "psychics": "No one may assume for an instant "that the possibilities of ether phenomena are limited by such interactions as have "hitherto found expression in treatises on physics. Indeed, there is already a body "of evidence which cannot safely be ignored, that physical phenomena sometimes

"take place when all the ordinary physical antecedents are absent, when bodies "move without touch or electric or magnetic agencies,—movements which are "orderly, and more or less subject to volition. In addition to this is still other evi- "dence of competent critical observers that the subject-matter of thought is directly "transferable from one mind to another. Such things are now well vouched for, "and those who have not chanced to be a witness have no *a priori* right from phys- "ics or philosophy to deny such statements. Such facts do not in any way invali- "date physical laws, nor make it needful to modify present statements concerning "energy. Physical laws are not compulsory; they *rule* nothing; they are but state- "ments of our more or less uniform experience. If these things be true, they are "of more importance to philosophy than the whole body of physical knowledge we "now have, and of vast importance to humanity; for it gives to religion corrobo- "rative testimony of the real existence of possibilities for which it has always con- "tended. The antecedent improbabilities of such occurrences as have been called "miracles, which were very great because they were plainly incompatible with the "commonly held theory of matter and its forces, have been removed, and their "antecedent probabilities greatly strengthened by this new knowledge; and reli- "gion will soon be able to be aggressive with a new weapon." T. J. McC.

THE HISTORY OF TRADE UNIONISM. By *Sidney* and *Beatrice Webb*. London: Longmans. 1894. Pp. 558. Price, $5.00.

The bulk and broad title of this work sharpen an expectation of more than it actually presents. It does not give a history of Trade Unionism generally, but of *English* Trade Unionism particularly. It does not afford a complete picture of the origin or growth or organisation or activity of any one of the great Trade Unions of Great Britain, but confines itself rather to a history of the general movement of those combinations. Neither is it critical: "all analysis of the economic effects of trade union action is reserved for a subsequent volume on the Problems of Trade Unionism"; and then,—so the authors, with probably a consciousness of omission promise us,—the annals of the separate unions will be more fully drawn upon.

The vivacity of thought and action, characteristic of European civilisation during the eighteenth century, was especially marked in economic affairs. Invention grew apace; the industry of the gilds was felt to be cramped and the modern factory system gradually asserted itself,—at first slowly, but at length toward the close of the last century with crushing strength. Instead of an industrial organisation in which the humble apprentice might reasonably hope, albeit by slow stages, yet surely to attain to a mastership, with its concomitant possession of raw materials, of means of production, of security against over-hot competition, of placid enjoyment of the fruits of industry, in short of *otium cum dignitate*,—industry assumed a new form in which the toilers remained, their life long, hopeless toilers, and the masters were such, not by reason of long service and preparation, but of *capital!*

Instead of the long-existing *vertical* cleavage of industrial society, there was soon observed the *horizontal* cleavage with which alone we are acquainted.

In England, the industrial disturbances peculiar to the gild-age were well met and controlled by the "Elizabethan Laws"; and with these, existing for many decades after the modern revolution had begun its stealthy progress, it was sought to confront the bewildering succession of strikes, crimes, riots, which, inexplicably, grew with the increasing productiveness of human exertion.

The workmen saw in these ancient laws a protection against the factory, for by them the proportion of apprentices was limited and laborers forbidden who had not served long years of preliminary training.

The new class of employers, banding themselves and throwing their united force against such barriers to the gigantic wealth-bringing exploitation of labor and capital opened to them by the new methods of manufacture, found in the old enactments a powerful weapon of offence: the rigorous provisions against combinations and strikes, which former well-meaning legislatures had built up, thinking that they had themselves for all time satisfactorily regulated the relations of industry and therefore rendered any measures of self-help on the part of men or masters superfluous and in a way rebellious.

Here is the field for which the now hostile divisions of industry have ever since been contending. By the former class of provisions, the laborer's standard of life was legally maintained. By the anti-combination enactments, the law-giving power had sought to prevent the numerically strong workers from pushing their vantage too far, to the ruin of the masters and to the menace of public peace and prosperity.

At the outset of this revolution of industry, the masters had peculiar auxiliaries. At the close of the eighteenth century the industrial dissensions had become really alarming; and the horrible events of the French Revolution materially assisted the employers in obtaining the Anti-Combination Laws of 1799, by which all combinations of workingmen but the ancient friendly societies became at once criminal and subject to the full force of the State. The individualistic theories of the new science of political economy, again, afforded agreeable catchwords, by means of which these laws were kept on the statute books over a quarter of a century, in the face of a most steadfast struggle for their abrogation.

Again, the wealthy and schooled employers were capable of quick and powerful organisation; the men were slow and weak from ignorance, their numbers, the exaction of family wants.

And, after all, the enactments which the men sought to maintain were antiquated; they failed to meet the new conditions so as to protect the workers, and if executed they would have stood in the way of the nation's industrial supremacy.

Thus, in the first vicious struggles, the men were completely vanquished; the working classes of Great Britain were plunged into the depths of animalism, perhaps more deeply than those of any other commonwealth undergoing the same great change to modern industry.

Such is the state of affairs about 1825–1830.

The old gild organisation maintained itself to some degree among a few of the trades less subject to the innovations of machinery. To their old trade clubs of journeymen, led by the indefatigable Francis Place, it is to be ascribed that the Combination Laws were in 1825 repealed.

But the workers in the trades where the factory system had developed itself, being sunk to that low level of intelligence that they committed violence upon factories and machines as their arch-enemies, were lifted to self-management by members of the upper classes. These were the textile-workers and their kindred. Later, too, the mine-workers. Appalled by the misery of these, their fellow-citizens, philanthropists organised them to agitate for legislation to control the conditions of employment; and in this way was the great code of English factory legislation slowly developed.

Thus there grew up a dual movement in English trade unionism, observable down to the present day: *The first*, that of the trade clubs, friendly societies, trade unions proper, restricted to one trade or group of kindred trades, apparently having for their main object so-called mutual benefits, and only for a secondary the social and political agitation for the legal emancipation and improvement of their society, holding fast to the idea of independent collective bargaining by the organised trade with the employers, and contemning the help of legislation for favorable conditions of employment *The second*, that of organisations, more transitory but often of vast power in the State, which directly agitate for the assistance of Parliament for the regulation of employment, thus sanctioning the latter with the solemnity of the public will.

It is the former movement on which this work lays particular stress; rather too much neglecting the latter. Though incompletely, it contains a mass of new information on various features of the growth, organisation, and policy of the friendly societies and trades unions, their periodic efforts at national all-trades-embracing amalgamation, their trades councils, trades union congresses, and Parliamentary committees. It portrays briefly and well the leading figures in the trades-union movement. It indicates more fully than any other the different economic ideas which have swayed the movement at various periods. It points out the practical results, economical, political, and social, accomplished by the unions, delineates with considerable skill the spirit of aristocracy manifested by the rich old trade unions toward their humbler unorganised fellows, like the dockers and the miners, and the "New Unionism" which has now obtained the mastery, and affords to us the key to the state of transition characteristic of English trades unionism to-day.

A final chapter presents a very valuable census of trades unionism as it exists in England in the years 1892–1894. And at its close we find an excellent bibliography, which it is left to some other author to utilise for a completer and more cosmopolitan history of trade unionism.

O. W. Weyer.

PSYCHOLOGIE DES GRANDS CALCULATEURS ET JOUEURS D'ÉCHECS. By *Alfred Binet*. Paris: Hachette & Co. 1894. Pp. 364.

For several years M. Binet has been making experimental researches on the different forms of memory with the idea of producing something useful to pedagogy. The present work in which the partial results of his studies are published is divided into two parts, the first of which treats of the great mental arithmeticians and their work, and the second of the psychology of chess-players, especially of blindfold players After a brief historical *résumé* of the subject of arithmetical prodigies, M. Binet takes up the case of Jacques Inaudi, a renowned mental calulator born in 1867, now giving public exhibitions in France. It is impossible with our limited space to give a full account of the data recorded by M. Binet. We shall limit ourselves to a few results which he claims as new.

The case of M. Inaudi, M. Binet claims, furnishes us with a fresh contribution to the theory of partial memories. In M. Inaudi, as in all arithmetical prodigies, the memory for figures is abnormally developed, the other memories not. But exactly here an important distinction is established by M. Binet's researches; the distinction, namely, of the *acquisitive* power of memory and of the *extent* of memory. The acquisitive power of memory refers to the maximum number of figures that can be repeated after a *single* hearing; the extent of memory to the number of figures that can be preserved in the memory after *several* hearings. Although M. Inaudi after several hearings could retain in his memory three hundred figures and with great effort four hundred, yet he could only repeat forty-two from having the figures read once. M. Inaudi is a perfect type of auditive memory. In his memory of figures he does not use number-forms or visual imagery of any kind; he remembers figures principally by their sounds. M. Inaudi's methods of calculation are original, and slightly different from the traditional methods. In subtraction he begins at the left, always operating with groups of three figures. His fundamental method is multiplication. To divide and to extract roots he multiplies, which for mental calculations, if one knows that whole numbers are required, is certainly the easiest course and that universally employed by good arithmeticians. In performing multiplications he breaks up his multipliers and multiplicands into lesser numbers, and after performing the resultant simpler multiplications adds the results. For example, to multiply 325 by 638 he multiplies 300 and 25 each by 600, by 30, and by 8, adding the totals. The problems which M. Inaudi solves are of the stereotyped class. The most difficult are of this order. Find four squares the sum of which is 13,411. M. Inaudi gave his first solution in three minutes, his second a minute after the first, and shortly after that a third solution. The secret of M. Inaudi's performances consists chiefly in his wonderful partial memory for figures, and not in any exceptional mathematical power. Comparative experiments were made with the professional accountants of the Bon Marché with the result that M. Inaudi is not more rapid in simpler computations than the professional accountants, but only in the larger ones which require a great span of memory.

The case of M. Diamandi, a second calculator, offers nothing remarkable; his type is the visual type; he performs multiplications by memory of position. In two chapters which conclude this part of the book M. Binet gives us an interesting discussion of visual and auditive memory, as also of "the simulation of memory" or apparent memory. With respect to this last his conclusion is that no importance is to be attached to the number of figures which a person retains at any given moment in his memory and which he can repeat without error; a person versed in mnemotechny can recite and repeat an indefinite number of figures, as also learn and repeat an indefinite number of figures recited to him. From a review of their family histories, early condition, and environment, M. Binet concludes that arithmetical prodigies form a true natural group, the distinctive characteristics of which are as follows: no hereditary influence, nor influence of environment; low birth; abnormal precocity; the aptitude for computation manifests itself in the child when still illiterate; the absorption of the whole mind by figures; and finally the aptitude in question is developed by exercise and diminishes rapidly by disuse.

The discussions and experiments relating to chess-playing generally and to blindfold chess in particular, are full of information, though the results are what one would naturally expect. Three elements are predominant in blindfold chess: erudition, memory, and imagination. The significance of erudition is evident. The memory referred to is the memory of recapitulation; the going over of old plays and the forecasting of new ones. The imagination referred to would be called in technical psychology "visualisation" and refers to images of fixed positions and of possible movements. These images M. Binet calls visual geometrical images, and claims to have described for the first time this special form of the visual memory. *μ.*

AUGUST COMTE ET HERBERT SPENCER. Contribution à l'histoire des idées philosophiques au XIX. siècle. By *E. de Roberty*. Paris: Félix Alcan. Pp., 200. Price, 2 frs. 50.

In that great flux of ideas and systems, the aim of which is to fix beliefs and convictions, says M. Roberty, two great conflicting movements have existed from time out of mind: monism and agnosticism. In the infancy of philosophy this conflict was normal. To-day it presents certain pathological aspects. The spirit of synthesis has exhausted itself in attempts to blend and reconcile these opposing views, but in vain. The philosophy of the nineteenth century follows in the beaten paths of the metaphysics which preceded it,—a metaphysics modelled upon the monotheistic traditions of the higher religions. It unites, unconsciously and irrationally, the quest for unity with the old inherent dualism of knowledge, reviving the most dangerous and disgraceful of fallacies.

In previous works of his, *L'agnosticisme* and *La recherche de l'unité*, both mentioned in *The Monist*, M. Roberty has pointed out some characteristic features of this fundamental antinomy of human thought. The very effort after a universal

synthesis militates against agnosticism. We break the elementary laws of logic in conjoining a theory which affirms the ultimate unity of things with one which asserts our inability to scrutinise the impenetrable depths of nature. We fall into the error of taking the negation of unity, of pure abstract knowledge, the Unknowable, for something distinct from the phenomenal world. In this light, according to M. Roberty, philosophers may be grouped into two great classes. In the one are found Democritus, Bruno, Spinoza, Leibnitz, Fichte, Hegel, Schopenhauer, and Spencer, who sought to correct agnosticism by monism; in the other are found Socrates, Aristotle, Bacon, Descartes, Locke, Hume, Kant, and Comte, whose monism is accompanied with an agnosticism which is logically less defective. For his present study, as best calculated to elucidate the tendencies of modern thought, M. Roberty chooses the two last of these philosophers.

Three powerful intellectual currents are introduced with August Comte, three grand directive ideas were disengaged from his philosophy. They are (1) the *agnostic* current, the greatest and most violent, or the idea of *limit*; (2) the *historical* current, or the idea of *evolution*; (3) the *monistic* current, or the idea of "cerebral unity." "Why now," asks M. Roberty, "or rather, how, did the thought of this obscure teacher of mathematics, August Comte, come to dominate a whole century? For two reasons. First, it pretended to combine in one dogmatic bundle two implicitly contradictory tendencies, while to all appearances it resolved one of the oldest and most obstinate of the antinomies of the mind; secondly, August Comte was, above all, a *populariser of genius*. He democratised philosophy. By positivism, philosophy, serious philosophy, was brought, for the first time, within the range of the great mass of minds.

"The scientist for whom the notion of *degree* possesses real importance, should "beware of prematurely reducing the organism to a mechanism, and *vice versa*. "But the philosopher in identifying like concepts should never forget that his gen- "eralisations pursue a purely logical end. Philosophical causality, general or uni- "versal causality, by rights should be neither mechanical nor organic. In the first "case, the thinker will become implicated in the contradictions of materialism; in "the second, will fall a prey to the illusions of teleology. August Comte escaped "neither of these pit-falls."

With respect to Mr. Spencer's endeavors to derive multiplicity from unity, life from death, movement from rest, etc., M. Roberty says that the same conclusion as that in which this great philosopher sums up his researches is to be found among all the early thinkers under the form of the law of causality, or under that of the principle of logical identity.

The thesis, as we see, which M. Roberty chiefly wishes to establish is, that the *substratum* or substance of the universal conceptions of the past, theological as well as metaphysical, may, in a last analysis, be reduced to three great dogmas: agnosticism, evolutionism, and monism; that each plays a different part according to the epoch, and especially according to the state of advancement of the positive sciences.

M. Roberty has added a postscript to his book, on the relations of monism to reality, and announces that he is at work upon an ethical treatise which will appear within a year, entitled *La déception du bien et l'immoralité future.* μ.

ASPECTS OF PESSIMISM. By *R. M. Wenley*, Lecturer on Philosophy in Queen Margaret College, Glasgow. Edinburgh and London: William Blackwood & Sons. 1894. Pp. 337.

The six essays which constitute this work have for their titles: "Jewish Pessimism"; "Mediæval Mysticism"; "Hamlet"; The Pessimistic Element in Goethe;" "Berkeley, Kant, and Schopenhauer"; and "Pessimism as a System." The author has contemplated for some time an exhaustive work on Pessimism, but preoccupation of various kinds has prevented him from carrying out his plan. His hope is, therefore, that the two technical essays of this collection, the two last, will be regarded as suggestive rather than as final. "They represent preparatory inquiries, not concluding deliverances." In them, however, will be found the author's views of his subject.

"Monism," he says, "in some form or another, is doubtless the goal of mod-"ern thought. But it has already been tried, and its results have proved suffi-"ciently disastrous. Why, then, do we tend to adopt it? It is to be borne in "mind, with Berkeley, that whatever our theories or methods, the problem of phi-"losophy is the Absolute. To see all things in relation to God, and as connected "with what may be provisionally called God's moral government of the universe, "is the ideal. There is a large measure of faith in philosophising. For, al-"though many questions defy our best efforts, and although the attempted rebuild-"ing of the universe to our own souls is always inadequate, the very fact that the "problems exist, and the very truth that there is a universe—not a chaos—irresist-"ibly brings home certain convictions. Taking life at its highest worth for me as "a person, accepting the 'music of the spheres' as musical for me, I must invari-"ably, if in the widest sense, declare, *Credo ut intelligam.* . . . So intimately is this faith bound up with speculation, that it may be dogmatically said, if a man be 'uncertain about God he cannot be sure about anything. Psychology itself, in so "far as it forms the necessary prelude to philosophical investigation, bears witness "to this. For it implies not simply self-reflexion and experiment upon the bodily "organism, but also appreciation of the past, belief in what mental activity has "already accomplished. It presupposes, that is, an order ruled by mind, which is "not of individual creation; nay, in such an order is the pledge of its existence no "less than the voucher for its value."

"Startling as the utterances of modern pessimism may appear," we read again, "they are no products of capricious self-dissatisfaction. They do not necessarily "bear witness to broken ideals, to adverse fortunes, or to embittered lives. They "are rather the results of matured reflexion on the graver problems of metaphys-"ics, ethics, and religion."

Yet as a *correct philosophy* how does pessimism stand? In its Schopenhauerian shape "it conforms to scarcely one of the requirements of a monistic theory; and "this is the more certain, that it has been repudiated in essentials by later sympa- "thisers. Suicide by metaphysics is the end which it proposes to man; it is itself "a metaphysical *felo de se*, and as such may be taken either for dead or unaccount- "able."

In Hartmann, whom he considers as Schopenhauer's equal, and in some respects his superior, the author finds five chief defects: (1) the insufficiency of the Unconscious as a principle of monism; (2) the metaphysical absurdity of pessimism; (3) its basing its moral theory upon a teleological view of the world; (4) that neither pleasure nor pain is the criterion of the moral worth of a life; and (5) the inadequacy of the theory as a philosophy of religion.

The author concludes: "The cumulative action of morality, having for chiefest "illustration the influence of Jesus, is a standing fact which neither Pessimism nor "Eudæmonism can compass. The real sacrifice of the whole man to what heart "and head recognise as the good character can neither be surmounted by Pessimism "nor grounded on Hedonism. Far rather, personal devotion to the perfecting of a "society, which includes self, transcends the painful half-truth of Pessimism and "the derogatory untruth of Sensationalism. For, the destruction of sin is to be "accomplished neither by the cessation of pain nor by the positive satisfaction of "sense, but by that active purifying of heart which, be theories what they may, "constitutes man's single means of communion with God." *μ.*

Ethics of Citizenship. By *John Maccunn*, M. A., Professor of Philosophy in University College, Liverpool. New York: Macmillan & Co. 1894. Price $1.50. Pp., 223.

The purpose of this handsome little book is "to connect some leading aspects of democratic citizenship with ethical facts and beliefs." The nine essays constituting it are called: "The Equality of Men," "Fraternity," "'The Rights of Man,'" "Citizenship," "The Rule of the Majority in Politics," "Party and Political Consistency," "Democracy and Character," and "Some Economic and Moral Aspects of Luxury." "In *The Equality of Men* justification is sought for the be- "stowal upon the citizen of civil and political rights, as well as for the increased "attention given of recent years to questions relating to the distribution of wealth; "and this justification is found, not in the untenable doctrine that men are equal, "but in the fact recognised alike in moral and in religious experience, that the "humblest member of the community possesses a spiritual worth which effectually "parts the man from the chattel and the animal.

"The same idea is applied in *Fraternity* to a consideration of the nature of "social ties. Powerful as are the forces which make for individualism, and even "for the disintegration of society, these, it is contended, find a final limit in that "mutual respect and sympathy which arise between man and man, as soon as each

"begins to recognise in his neighbor that principle of moral life which he feels "bound to acknowledge and prize as his own highest endowment. It is on Equal- "ity and Fraternity, as thus interpreted, that democratic citizenship is, in these "pages, held to rest; and it is to realise these fundamental ideas that it is justified "in becoming practical.

"No attempt," the author says, "is made to discuss in detail the manifold "ways in which a complete and satisfying citizenship may be realised. But two "aspects seem to demand special attention. The one concerns the citizen's atti- "tude to the Majority, through which a democracy expresses its will; and the "other his relation to Political Party, as the recognised instrument by which con- "viction finds effective enactment."

The essay "*Democracy and Character* is an attempt to estimate the influences "which a democratic form of society, especially when it is commercial and indus- "trial, tends to exercise upon moral character. It is not denied that there are rea- "sons for misgiving and apprehension; but, as against these, grounds for confi- "dence are sought, firstly, in the fact that there is already so much in democratic "development to strengthen the belief in the worth and possibilities of men; and, "secondly, in the hope that the spirit of Democracy, rightly understood, will find "an unfailing ally in Religion." The considerations advanced in the last essay, *Some Aspects of Luxury*, are unique and deserve consideration. The ease, soberness, and moderation of Professor Maccunn's utterances win from the start the reader's interest. *μ.*

Our Notions of Number and Space. By *Herbert Nichols, Ph. D.* Boston: Ginn & Company. Pp., 201. 1894.

To quote his own words, Mr. Nichols's thesis is this: "Our brain habits, with "the modes of thought and of judgment dependent thereon, are morphological re- "sultants of definite past experiences: our experiences, and those of our ancestors. "Each limited experience does its share toward fixing a limited habit. The ex- "periences most common to our various regions of skin, differ widely one from "another; those of the tongue, from those of the fingers; those of the fingers, from "those of the abdomen, and so on. Our habits of judgment, based on these sev- "eral avenues of experience, ought therefore, when compared with each other, to "betray permanent characteristics running parallel with the local differences of "anatomy, of function, and of experience, which gives rise to them, and in which "they are rooted. Investigation proves this to be the case. It shows that our "judgments of the same outer facts, such as of number and of distance, vary greatly "when mediated by different tactual regions. And what is of greater importance "to the science of psychology, these variations in judgment bear distinguishing "ear-marks of the kinds of experience out of which, and by reason of which through "life, they have slowly risen,"

The results of his investigations Mr. Nichols formulates in 109 short para-

graphs. Owing to their number, and the abstract form of their expression, we shall quote only the concluding paragraph, which may give the reader an idea of what Mr. Nichols has aimed at and done: "The origin and foundation of our thesis "must be fundamentally placed in the following law: Presentations of Number, of "Distance, and of all Spatial Figures and arrangements in general, are alike based, "primarily, upon serial events differing greatly in mode, such as become charac- "teristic of those modes of presentation which we call numerical, extential and "spatial, but all of them governed by the same fundamental laws of relationship. "By reason of this, *all simultaneous presentations are dependent upon, and expres- "sive of, the several modes of serial occurrence out of which, through life, they have "evolved, and become differentiated.* From the simplest presentations to the most "highly developed functions of judgment, we find this same system of laws articu- "lated everywhere into one common Genetic System of Mental Development." *μ.*

THREE LECTURES ON THE VEDÂNTA PHILOSOPHY. Delivered at the Royal Institution in March, 1894, by *F. Max Müller*, K. M., Member of the French Institute. London and New York: Longmans, Green, & Co. 1894. Pp., 173. Price, $1.75.

Few writers surpass Prof. F. Max Müller in popular exposition. Rigid professional scholars sometimes object to his artifices, but their cavils rarely reach or influence that portion of the world which he addresses. Whatever their short comings, perhaps they have none, the purpose of the present three lectures is well served. What the general reader wants is not painfully and correctly elaborated details, but a general impression or picture of things and events. If he reads this little book of Prof. Max Müller's he will certainly get that. The Professor's easy, confident style leaves no doubts in the trustful mind, and we take from his books those warm, living pictures of his subjects which it is his laudable ambition to convey. *μκρκ.*

HYPNOTISMUS UND SUGGESTION. Eine klinisch-psychologische Studie. By *Prof. Dr. Moriz Benedikt.* Leipsic and Vienna: M. Breitenstein. 1894. Pp. 90. Price, 2 Marks.

This lively little pamphlet is the latest contribution to the acrimonious controversy which is now being waged between Professor Krafft-Ebing and Professor Benedikt anent the former's reputed discovery of a medium, a lady thirty-three years old, who can be put back by hypnosis into earlier periods of life and be made to act the character of that period with a consistency far beyond the powers of recollection. (See *The Monist*, Vol. IV, No. 1, page 156.) It is a very instructive piece of polemic, and should be read by all persons engaged in hypnotic and psychiatrical studies. Only one chapter or part is nominally devoted to "the development of Krafft-Ebing's psychological equation," but its forcible resolution gives color to the whole work. Professor Benedikt assures us, however, that he has a moral aversion to personal polemics, and undertakes the execution of Professor Krafft-Ebing only

from scientific necessity. His remarks about the method of medicine are excellent and worthy of close consideration. Especially does he insist on the necessity of mathematics and mechanics as a propædeutic to such researches. The question with whose solution the work is ostensibly concerned is the fabrication and development of mediums. The results are: (1) Post-hypnotic actions, where they are not rank comedy, are conditioned by the emergence of memories from the hypnotic state possessed of the full intensity of real perception-memories; (2) in the somnambulic state memories of former somnambulic states arise, and if they have the same or a similar purport, mutually complement one another, so as to form a whole; (3) memories of the waking state are carried into the somnambulic state, and influence conduct in the same; (4) these memories of the waking state sharpen the attention in the somnambulic state and produce a certain consistency and system of conduct which is lacking in ingenuous subjects. In fact, anticipated attention at the beginning of the experiment can actually transform the somnambulic state into a normal conscious state. With respect to the personal strictures of this pamphlet, it remains to be seen what Krafft-Ebing will reply. *μκρκ.*

Zur Lehre vom Inhalt und Gegenstand der Vorstellungen. Eine psychologische Untersuchung. By *Dr. Kasimir Twardowski*. Vienna: Alfred Hölder. Pp., 111. 1894.

The purpose of this investigation is to establish and examine the differences between mental presentations where they relate simply to the contents of presentation and where they serve as the designation of objects. The remarks of the author are instructive and show well the current confusion of psychological terms. Everything that is presented, or, as we may say, conceived, by presentation, be it what it may, is called object (*Gegenstand*). The objects are either real or not real. They are either possible or impossible. They exist or do not exist. Their common attribute is that they can be or are the object of psychical acts, that their verbal designation is the name, and that regarded as a class they form the *summum genus*, which finds its usual spoken expression in the word "something." The images, percepts, or ideas which correspond to class-notions are single objects, in the sense defined, and different from the objects of the individual percepts belonging under the class-notion. The character of the act of presentation, the contents of the presentation-images, or class-images, individual images, and the manifold relations of the presentation-continuum, as Mr. Ward calls it, are discussed—in a manner which may be gleaned from the above brief remarks. *μ.*

Die Ethik des Stoikers Epictet. By *Adolf Bonhöffer*. Stuttgart: Ferdinand Enke. Pp., 275. 1894.

In a previous work, *Epictet und die Stoa* (Stuttgart, 1890), Mr. Bonhöffer pointed out the essential dogmatical agreement between Epictetus and the Stoics, showing the importance of that philosopher for the history of many imperfectly understood

Stoic ideas. What in that volume was done for psychology and the theory of knowledge, the author here proposes to do for ethics. Mainly, however, it is an independent exposition and deals rather with the ethics of Epictetus as an individual philosopher, than with his relations with the Porch. To copious notes the author has added an excellent classified index—a rare sight in a German work, but one which makes the present production exceedingly handy as a volume of reference. In an Appendix, the author treats at length (90 pages) of Stoic ethics proper, though with no claim to exhaustiveness. Mr. Bonhöffer's work gives one the impression of care and thoroughness, and his expositions place in a clear light the historical importance of Epictetus's ethical ideas, as well as their relationship with the views of the great philosophers and with Christianity. *μ.*

Was will der kritische Realismus? Eine Antwort an Herrn Professor Martius in Bonn. By *Hermann Schwarz*. Leipsic: Duncker & Humblot. Pp., 40. Price, 1 mark. 1894.

Mr. Schwarz is the author of a work entitled *Das Wahrnehmungsproblem vom Standpunkte des Physikers, des Physiologen und des Philosophen* (1892). Recently, Herr Professor Martius of Bonn "recensed" the *Wahrnehmungsproblem* in the *Göttinger Anzeigen*, but his recension shot so wide of the mark that, to judge from Mr. Schwarz's statement, he must have aimed at a different book, or had in his eye some other philosophical system. Hence, Mr. Schwarz writes this brief pamphlet to tell Professor Martius what his system is. Readers of the *Wahrnehmungsproblem* will, no doubt, be glad to have this explanation of Mr. Schwarz. *μ.*

Die Philosophie der Freiheit. Grundzüge einer modernen Weltanschauung. By *Dr. Rudolf Steiner*. Berlin: Emil Felber. 1894. Pp. 242.

The essential characteristic of the present age the author finds in the evident striving of individual culture to make itself the centre of all the interests of life. To bear the stamp of validity, a thing must have its origin deep in the roots of individuality. This, in a certain form, is the gospel of the development from within outwards which Goethe championed. Between heredity, tradition, iron-clad custom, and the independent mind filled with new ideas, a constant battle is fought—the battle of knowledge against belief. Man, however, must not bow to the new idea lest he be what he was before, but must make himself master of it. The ground or reason for the translation of an idea into actual reality by the agency of the individual man can be found only in the man himself. For an idea to become an act, a man must *will* its transformation. But such a volition can spring solely from man himself. Man is the ultimate mover of his acts; *he is free.* *μκρκ.*

Dolore e Piacere, Storia Naturale dei Sentimenti. By *G. Sergi*. Milan: Dumolard. 1894. (Pp., xv and 395; price, lire 4.50.)

Grief and Pleasure is an attempt to demonstrate scientifically the correctness of the popular belief that the region of the heart is the seat of the feelings; that

grief and pleasure do not originate where thought is developed, but are alterations of the functions of organic life rendered apparent through the agency of the medulla oblongata. This, then, is the centre of grief and pleasure, whether provoked by organic, physical, sensible stimulus in any part of the body, or by perceptions, ideas, thoughts, transmitted through the brain. It is from here that the impulses proceed that modify and disturb the organic life, beginning with the heart and the respiration.

The author presents many proofs of this theory, but warns us that as the theory and the book were each a long slow growth neither can be understood or appreciated till the whole book has been read. He finds suggestions of this theory in the writings of Hack Tuke, Brown-Séquard, Laycock, Spencer, Hall, James, and Monselice, and additional evidence at the last moment in the work of Dr. Mosso on *The Temperature of the Brain* (Milan, 1894). This last curious collection of studies shows that the temperature of the brain is not increased by thought, but is by the emotions, a fact that our author explains by his theory: because in the generation of thought all the energy of the brain goes in that direction, while in the transmission of the emotions from their independent centre to the brain, the seat of thought, there is an excess of energy which is transformed into heat.

The book, written by a well-known Italian author, is curious and interesting. The chapters are: Introduction: General Characteristics of Psychic Phenomena. Chapter I. Irritability and Sensibility. II. Sensation. III. Grief and Pleasure. IV. Emotions. V. Physical Bases of the Emotions. VI. Mechanism of the Emotions. VII. Genesis of the Emotions. VIII. Genealogy of the Emotions. IX. Moral Sentiments. X. Psychological Synthesis of the Emotions. XI. Physiognomy. XII. Influences and Variations. XIII. Pathology of the Emotions. XIV. Æsthetic Sentiments. XV. Origin of the Æsthetic Sentiments. XVI, XVII. and XVIII. Analysis of the Æsthetic Sentiments. XIX. Religious Sentiment. XX. Evolution of the Sentiments. G. C. H.

Lo Scetticismo e Gaetano Negri. By *G. Morando*. Milan: Cogliati. 1894. 1 Lire. Pp. 100.

This volume is the development of an article published in the *Rassegna Nazionale*, the journal, according to Negri, "which is the most authoritative expression of that Catholicism which would be at the same time orthodox, progressive, and national." It was called forth by the publication of *Rumori Mondani*, the last work of Senator Negri, and is an attempt to state and then to refute the materialistic or agnostic principles and theories contained in this and preceding works of the author of "George Eliot." Morando arms himself with the weapons of Plato, the Fathers of the Church, and Rosmini, to combat Aristotle, Kant, and their disciple Negri, and sufficiently indicates his endeavor after fairness by the two mottoes which he recommends: "To those rationalists who struggle in vain in the straitjacket of their doubts, I say—The truth shall make you free. To those believers

who may be unjust to the truth for vain human reasons, I say—Freedom shall make you truthful. The former are vital words of Christ, the latter a profound and worthy inversion of them." G. C. H.

KANT'S INAUGURAL DISSERTATION OF 1770. Translated into English by *William J. Eckoff*. Professor of Philosophy and Pedagogy in the University of Colorado. New York: Columbia College. May, 1894. Price, 90 cents. Pp, 101.

The second number of the first volume of the "Columbia College Contributions to Philosophy, Psychology, and Education," the purpose of which we spoke of in our last issue, consists of an English translation of Kant's inaugural dissertation, *De mundi sensibilis atque intelligibilis forma et principiis*, of a general historical introduction, and of a discussion of the position of the *Dissertation* in Kant's critical system. It is as refreshing as it is rare to see the broad view which the editor of the translation takes of the relations of philosophy with the practical religious and social problems of the day, and to note the commendable zeal with which he attacks his subjects. It is his conviction that Kant can best be understood, not by the utilisation of his numerous commentators, but by calling on Kant personally to explain himself. Mr. Eckoff proposes, accordingly, as part of his plan for eliciting the responses of the master, to prepare a series of monographs covering the field of the pre-Critical work of Kant in Kant's own language, "with no more additions from the writer than would suffice for connective tissue." The present paper is a part of this larger plan. The *Dissertation* is claimed as the turning-point in the development of the philosophy of Kant. According to Professor Windelband the *Dissertation* belongs to the pre-Critical period. On this point Mr. Eckoff takes issue with Professor Windelband, and from the discussion, the unprejudiced reader will be led, we think, to take Mr. Eckoff's side. Typographically, the volume is not exemplary. Half the time, the use of quotation marks is discarded, causing the reader considerable annoyance. *µ*.

RICHARD CUMBERLAND ALS BEGRÜNDER DER ENGLISCHEN ETHIK. By *Frank E. Spaulding*. Leipsic: Gustav Fock. Pp., 101. 1894.

A dissertation presented to the faculty of the University of Leipsic for the degree of Doctor of Philosophy. It is the first monograph, the author states, which has been published on Cumberland. It gives a sketch of that philosopher's life, character, and works, and is clearly written. *µ*.

PERIODICALS.

THE PSYCHOLOGICAL REVIEW. VOL. I. NO. 4.

REVERSE ILLUSIONS OF ORIENTATION. By *Alfred Binet*.—DIRECT CONTROL OF THE RETINAL FIELD. By *George Trumbull Ladd*.—PSYCHOLOGICAL NOTES ON HELEN KELLAR. By *Joseph Jastrow*.—PSYCHOLOGY PAST AND PRESENT. By *J. Mark Baldwin*.—DISCUSSION, ETC.—(New York and London: Macmillan & Co.)

By "reverse illusions of orientation" (*le renversement de l'orientation*) M. Binet understands "illusions or hallucinations of orientation which arise spontaneously either when we waken in the darkness of night, or during the day when awake. . . . Generally the illusion is equivalent to the effect of a rotation of 180°: hence the impression of a turning or 'reversal.' . . . We still need to know whether the illusion is produced or not by a particular derangement of one sense-organ—possibly the semicircular canals of the inner ear. In experimental studies that have been made on the sensation of vertigo, no one has, to my knowledge, produced such illusions of the orientation of objects."

Psychological students will be well repaid by a perusal of Professor Baldwin's review of "Psychology Past and Present."

THE PHILOSOPHICAL REVIEW. Vol. III. Nos. 4 and 5.

THE FREEDOM OF THE WILL. By *Prof. Frank Thilly*.—THE MORALITY THAT OUGHT TO BE. By *Alfred L. Hodder*.—AFFECTIVE ATTENTION. By *Prof. E. B. Titchener*.—GERMAN KANTIAN BIBLIOGRAPHY. By *Dr. Erich Adickes*.

THE EXTERNAL WORLD AND THE SOCIAL CONSCIOUSNESS. By *Prof. Josiah Royce*.—THE PROBLEM OF HEGEL. By *Prof. John Watson*.—EPISTEMOLOGY AND ONTOLOGY. By *Prof. Andrew Seth*.—GERMAN KANTIAN BIBLIOGRAPHY (ix). By *Dr. Erich Adickes*.—BOOK REVIEWS.—(Boston, New York, Chicago: Ginn & Co.)

Professor Royce's article is a lecture read before the Philosophical Club of Princeton College, forming an introduction to a somewhat extended line of research.

John Watson breaks a lance for Hegel, bringing him nearer to the comprehension of modern readers by insisting that the only Absolute which is thinkable at all is an Absolute which is manifested in the Relative and which, therefore, has no reality apart from its manifestations. The world, accordingly, in its multifarious energies, whether as nature or as mind, is the expression of a self-determined unity.

Prof. Andrew Seth makes a few comments on Mr. Ritchie's article "The Relation of Metaphysics to Epistemology" in order to remove some of that writer's

misconceptions. An elaborate reply Professor Seth thinks no longer necessary, after having answered most of the points by anticipation in his article "Hegelianism and its Critics" in *Mind*, and in "Epistemological Conclusions" in the *Philosophical Review*.

Professor Thilly trusts that determinism is not, as has been claimed, a discouraging or paralysing doctrine. It does not destroy the energy of action. Fatalistic nations like the Mohammedans were far more energetic than Christian ascetics who believed in the will's absolute freedom.

THE NEW WORLD. Vol. III, Nos. 9 and 10.

Lotze's Doctrine of Thought. By *Henry Jones*.—The Human Element in the Bible. By *Philip S. Moxom*.—Universalism a Progressive Faith. By *A. N. Alcott*.—The Song of Solomon. By *Karl Budde*.—The Origin of Goodness. By *Minot J. Savage*.—The Problem of Paracelsus. By *Josiah Royce*.—The Ante-Nicene Doctrine of the Unity of God. By *Thomas R. Slicer*.—Dean Stanley and the Tractarian Movement. By *A. V. G. Allen*.—Book Reviews.

Baur's New Testament Criticism in the Light of the Present. By *H. Holtzmann*.—John Kelpius, Pietist. By *F. H. Williams*.—The Movement for Religious Equality in England. By *Edward Porritt*.—The Religious and the Historical Uses of the Bible. By *Frank C. Porter*.—The Episcopalian Polity. By *W. Kirkus*.—The Pauline Teaching of the Person of Christ. By *Orello Cone*.—The Significance of Pessimism.—By *R. A. Holland, Jr.*—Democracy and the Poet. By *Nicholas P. Gilman*.—The Book of Job. By *Bernhard Duhm*.—Book Reviews.—(Boston: Houghton, Mifflin & Co.)

As far as New Testament criticism is concerned the plea and the counter-plea, the accusation and the vindication of "Baur's New Testament Criticisms" may be put briefly and appropriately in these two propositions: "Baur was a negative spirit, who left nothing standing as genuine and apostolic in the New Testament except four epistles of Paul and the Johannine Apocalypse, and so gave a signal for general destruction";—"Baur was a positive spirit, since he was by no means satisfied with denying to a Biblical writing the authorship ascribed to it by tradition or named in the superscription, but claimed emphatically to practise 'positive criticism,'—to show the place which the various writings of the New Testament held in the general development of Christianity, and in which they are historically comprehensible." Professor Holtzmann adds: "Since Baur fulfilled this promise, he has brought the original condition of primitive Christianity into the light of historical probability. Historians and theologians have once more a common ground on which they can discuss the origin of Christianity. Since he helped to prepare this for them, Baur was a discoverer, a pathfinder, and a pioneer in the best sense of the word."

PHILOSOPHISCHE MONATSHEFTE. Vol. XXX. Nos. 3, 4, 5, and 6.

Subjective Kategorien in objectiven Urtheilen. By *Th. Lipps*.—Theorie der Typen-Eintheilungen. (II.) By *B. Erdmann*.—Psychologische Studien zur elementaren Logik. (I.) By *E. G. Husserl*.

Ethischer Rigorismus und sittliche Schönheit. Mit besonderer Berücksichtigung von Kant und Schiller. I. By *K. Vorländer*.—Aussichten der experimentellen Psychologie. By *O. Külpe*.—Von der Unsterblichkeit

DER SEELE. By *A. Spir.*—DE RERUM NATURA. By *P. Carus.*—LITTERATURBERICHT. (Berlin: Georg Reimer.)

Lipps's article on "Subjective Categories in Objective Judgments" is a contribution to formal logic in which he enumerates and distinguishes in detail a number of classes of judgment, a proceedure which, as Lipps says, may be tiresome but is not redundant.

Benno Erdmann finishes his "Theory of Type-Classifications," the last of which are types of languages. In the summary he calls attention to the need of recognising in logic, besides distinctly defined types, also such as stand in fluxional connexion, which may, but need not be, continuous. The whole whose parts stand in a fluxional connexion need not be a species but may be an individual object. It may be the development of a single concept. The field of divisions having a fluxional connexion is not only to be sought in the natural sciences but extends over all our practical and theoretical knowledge.

Husserl discusses in his "Psychological Studies of Elementary Logic" the distinction between abstract and concrete, and treats of *Anschauungen* and representations.

Vorländer discusses Kant's ethical rigorism as contrasted with Schiller's criticism, whose ethical ideal was æsthetically softened by his ideal of beauty.

Külpe reviews the progress of experimental psychology and calls attention to its importance.

A. Spir's "Immortality of the Soul" is a translation from the French of a posthumous work of the author. According to the statement of his daughter, the late Mr. Spir valued it greatly as his confession of faith. The article is remarkable in so far as Spir rejects the belief in individual immortality which to him is the summit of egotism, forming a natural contrast to moral sentiment. He points out, however, that men naturally cherish the confidence that their existence is not due to a mere accident, but is such as it is according to an eternal decree. This confidence is the vital basis of all religion. But it is commonly confused with the animal instinct of the preservation of self, which mixture produces the belief in an immortality of the conscious ego. Mr. Spir proceeds to show that the existence of man's ego is an illusion. It is a mirage hovering over an abyss destined to appear after a short time, and a close investigation proves its emptiness and intrinsic vanity. The cognition of this truth has produced modern pessimism, viz., that view of the world according to which life is without sense and worth. Many thinkers, Spir says, have called attention to the astonishing mixture of greatness and smallness that obtains in human nature, but no one has as yet clearly shown in what consists the greatness as also the ultimate cause of the misery of man. The path to salvation has been shown by the two greatest teachers of mankind, Buddha and Christ. But the doctrines of these masters are not without their defects; especially the doctrine of Christ (at least as it is taught in the Christian churches) is distorted by a belief in the immortality of the conscious ego, which is incompatible with salvation and the resignation of egotism. Spir has much to say about the Absolute and the impassable abyss between absolute and physical nature,—a theory which seems to imply an irredeemable dualism; but we do not intend to enter into a criticism of this part of his theory. Suffice it to summarise the main results of his argument which is morally sound and characterises his deep insight into the religious problem. He says, in order to escape from the vanity of life and secure immortality, in order to partake of the absolute and eternal life, one must resign oneself, that is, one's conscious ego, which is empty and illusory, and must identify oneself with one's true ego, with the normal

nature of things which is already defined, and with the eternal, by consecrating one's life to the good and the true. In theory most men are incapable of understanding self-resignation. They cannot overcome their natural egotism based upon their illusion of possessing an absolute ego. . . . Therefore, they desire a conscious immortality and try to believe in it. Happily, however, men are in practical life capable of performing many things, the theory of which they do not know. A tight-rope walker, for instance, could not explain mathematically the motions which he executes on the rope to keep his equilibrium, nor can the billiard expert offer a scientific demonstration of the strokes he makes; but their ignorance does not prevent their success. The same is true in religion. In theory most men are incapable of understanding the resignation of their egoity, yet in practical life self-resignation is not at all rare. . . . Give to a man a great cause and he will find it natural to sacrifice himself for it, yet will he, if the matter be left to his investigation, be incapable of comprehending the possibility or the advantages of his sacrifice which will accrue to his ego. Men possess the intrinsic sentiment that their true ego must not be sought in their conscious ego. Nevertheless they will find it difficult to form a clear idea of it.

De Rerum Natura, by Dr. Paul Carus, is a poetic expression of a world-conception based upon the same view as that of Spir's article, and the editors, Drs. Benno Erdmann and Paul Natorp (the first of Halle, the latter of Marburg), have purposely placed both contributions side by side in the same number. The editors wrote to the author, when he offered them his poem for publication, that poetry, according to their strict rules, was excluded from the *Philosophische Monatshefte*, but that under the present circumstances they would gladly make an exception. We do not intend here to enter into further details, but hope to be able to present to our readers a good English translation of the poem, which Mr. Charles A. Lane has promised to furnish.

THE AMERICAN JOURNAL OF PSYCHOLOGY. Vol. VI. No. 3.

STUDIES IN THE PSYCHOLOGY OF TOUCH. By *F. B. Dresslar*.—ON THE DIFFERENCE SENSIBILITY FOR THE VALUATION OF SPACE DIFFERENCES WITH THE HELP OF ARM MOVEMENTS. By *A. E. Segsworth*, B. A.—MINOR STUDIES FROM THE PSYCHOLOGICAL LABORATORY OF CORNELL UNIVERSITY. By *R. Watanabe*, Ph. M., *H. W. Knox*, A. B., *M. F. Washburn*, A. M.—ACCURATE WORK IN PSYCHOLOGY. By *E. W. Scripture*, Ph. D.—SOME PSYCHOLOGICAL ILLUSTRATIONS OF THE THEOREMS OF BERNOULLI AND POISSON. By *E. W. Scripture*.—THE RELATION OF THE INTERFERENCE TO THE PRACTICE EFFECT OF AN ASSOCIATION. By *John A. Bergström*.—PSYCHOLOGICAL LITERATURE. (Worcester, Mass.: J. H. Orpha.)

INTERNATIONAL JOURNAL OF ETHICS. Vol. IV. No. 4.

NATURALISM AND ETHICS. By *Right Hon. A. J. Balfour*.—EFFECT OF THE CLERICAL OFFICE UPON CHARACTER. By *Rev. Langdon C. Stewardson*.—RELIGIOUS SENTIMENT AND THE MORAL PROBLEM IN ITALY. By *Giacomo Barzellotti*.—THE LIMITS OF CASUISTRY. By *Rev. Hastings Rashdall*.—PRACTICAL ETHICS. By *William Knight*.—THE PUNISHMENT OF CHILDREN. By *M. M. Mangasarian*.—DISCUSSIONS.—BOOK REVIEWS. (Philadelphia: International Journal of Ethics, 118 S. Twelfth Street.)

The Rt. Hon. Mr. Balfour lays down in his article, "Naturalism and Ethics," two propositions: "(1) that practically, human beings being what they are, no

moral code can be effective which does not inspire, in those who are asked to obey it, emotions of reverence, and (2) that practically the capacity of any code to excite this or any other elevated emotion cannot be wholly independent of the origin from which those who accept that code suppose it to emanate."

Mr. Langdon C. Stewardson believes that "the evils of the patronage to which the holders of the clerical office are exposed are abundantly manifest. Now, as always, they are self-seeking, time-serving, the destruction of mental integrity and moral courage, together with the loss of that pure and lofty spirit of unworldliness which is of the essence of the kingdom of heaven." Yet he grants that there are many who conscientiously avail themselves of their exceptional opportunities for high and lofty thought, as well as the rare chances for the doing of good.

Giacomo Barzellotti describes the situation of his native country, saying that "the regeneration of the popular conscience and of Italian life cannot be accomplished without harmonising the modern spirit with the moral traditions of Christianity."

Mangasarian defines punishment as directing disobedience to its natural result —pain. He demands that every shortcoming of the child should be traced to its beginnings, and regarding the abuse of punishment as more dangerous than the greatest indulgence, objects to corporal and terrifying punishments, such as shutting up a child in a dark room. Punishment, he says, should be of such a nature that, if necessary, the parents can share it with the children.

MIND. NEW SERIES, No. 11.

MEDIATE ASSOCIATION. By *W. G. Smith.*—MR. BRADLEY'S VIEW OF THE SELF. By *J. S. Mackenzie.*—MR. BRADLEY AND THE SCEPTICS. By *Alfred Sidgwick.*—DEFINITION AND PROBLEMS OF CONSCIOUSNESS. By *A. Bain.*—DISCONTINUITY IN EVOLUTION. By *Francis Galton.*—DISCUSSIONS, ETC. (London and Edinburgh: Williams & Norgate.)

Prof. A. Bain thinks of consciousness as Hamilton does of individuals that it cannot be defined, or, as the old logicians said, that a view of the thing itself is its best definition. Consciousness, Bain says, is remarkably free from ambiguity, yet it becomes involved in a number of subtle and difficult problems. Instead of a definition he gives the following explanation: "Consciousness," he says, "means only that the mind is alive and at work in some of its manifestations and not in suspense or dormant." He then proceeds to discuss in brief paragraphs the "Object of Consciousness," "Truths of Consciousness," "Consciousness in Contrast to Mind," "The Conscious Area," "Consciousness as Essential to Memory," "Immediate Physical Conditions of Consciousness," "Reflex Actions and Consciousness: Animal Automatism," "Consciousness and Self-Consciousness"; winding up with the remark that the critical examination of the compound self-consciousness "readily gets beyond the pale of psychological adjustment."

PHILOSOPHISCHES JAHRBUCH. Vol. VII. Nos. 2 and 3.

SIND DIE CHEMISCH-PHYSIKALISCHEN ATOME NUR EINE FICTION? By *Linsmeier, S. J.*—WIDERSTREITEN DIE WUNDER DEN NATURGESETZEN, ODER WERDEN LETZTERE DURCH DIE ERSTEREN AUFGEHOBEN? (Concluded.) By *Pfeifer.*—UEBER DEN PLATONISCHEN GOTTESBEGRIFF By *Nassen.*—DER GRUNDPLAN DER MENSCHLICHEN WISSENSCHAFT. (Concluded.) By *Bahlmann, S. J.*—HANDSCHRIFTLICHES ZU DEN WERKEN DES ALANUS. (Concluded.) By *Baeumker.*

Ueber den Ursprung der Sprache. (Concluded.) By *Gutberlet*.—Die Aristotelische Materialursache. By *Reitz*.—Zu Kant's Schrift: "Die Religion innerhalb der Grenzen der blossen Vernunft." By *Schirotzky*.—Dr. Al. Schmid über die Erkenntnisslehre. By *S. J. Tilm. Pesch*.—Recensionen, etc. (Fulda: Fuldaer Actien-Druckerei.)

Dr. Gutberlet, editor of the *Jahrbuch*, concludes his articles on the "Origin of Language," but not being in need of Darwinism either in theology, natural science, or in philology, he appears to find the problem in the wrong place. Accordingly, his article is disappointing. He states in the conclusion that to the Christian philosopher the solution of the problem is facilitated since it presents itself under the simplest but most important conditions. He knows that man cannot have developed out of the animal kingdom, but is, at least so far as his soul is concerned, immediately called into being by the Creator. Further, he is convinced that an omniscient and all-beneficent God must place his rational creatures in such conditions and must endow them in such a way as to enable them to fulfil their divine mission. For us, education is the God-given mission of leading a human life and reaching our aim. To the first man education must have been replaced by divine endowment and instruction. God must have been his teacher and educator, and it must be expected that under such tutorship the spiritual powers of man would attain a far higher development than we can acquire by learning from our teachers.

Schirotzky, reviewing Kant's "religion within the bounds of pure reason," mainly objects to Kant's idea of the germ of goodness in man, calling attention to the prevalence of the originally latent falseness of the human heart.

ZEITSCHRIFT FÜR PSYCHOLOGIE UND PHYSIOLOGIE DER SINNESORGANE. Vol. VII. Nos. 2, 3 and 4.

Ueber den Ursprung der richtigen Deutung unserer Sinneseindrücke. By *H. von Helmholtz*.—Das Verhältnis von Accomodation und Konvergenz zur Tiefenlokalisation. By *Dr. Franz Hillebrand*.—Erklärung der Brentanoschen optischen Täuschung. By *F. Auerbach*.—Eine bisher noch nicht beobachtete Form angeborener Farbenblindheit (Pseudo-Monochromasie). By *Arthur König*.—Ueber die indirekte Sehschärfe. By *Th. Wertheim*.

Die Empfindung als Funktion der Reizänderung By *W. Preyer*.—Die Wahrnehmung von Helligkeitsveränderungen. By *L. William Stern*.—Ueber die Gültigkeit von Newtons Farbenmischungsgesetz. By *Emil Vonn*.—Zwei Fälle von Grünscheu. By *Dr. Somya*.—Litteraturbericht. (Hamburg and Leipsic: Leopold Voss.)

H. von Helmholtz discusses the origin of the symbolic nature of sense-impressions, comparing them with language. Considering the fact that the words of a language are to some extent arbitrary and varying, while natural events are constant, and bearing in mind how natural to us our vernacular appears, we can readily understand how our sense-impressions can symbolically represent the objects of our experience. Inborn in the organisation are man's reflex motions and impu'ses. But our concepts are formed under the influence of inductions mainly gained by the unconscious labor of memory.

Hillebrand, a disciple of Prof. Ewald Hering, discusses the problem of the cause of the third extension and the laws according to which it is measured.

F. Auerbach explains Brentano's optical illusions (see *The Monist*, Vol. III,

No. 4) as an erroneous judgment of distances, and details his explanations in additional illustrations.

Arthur König describes an interesting and new case of monochromasy, that is, of almost colorless seeing. The right eye of the patient is emmetropic and very strong, the left eye is hypermetropic. The patient recognises only very strongly colored tints of blue, red, and yellow, but is unable to distinguish between the two latter. The spectrum appears to him in the middle gray, which shows to both sides a weak yellow or blue coloring.

Wertheim investigates the distinctness of indirect vision, presenting the results of his experiments in a diagram.

Preyer comments upon the sensibility to change, discussed by E. W. Scripture in the same journal, by stating that the result of an irritation increases and decreases with the rapidity with which the irritation changes, and with the difference of the limiting values within which the positive or negative fluctuation of the irritation takes place. Sensation is never anything else than a perceived difference of irritation.

Dr. Somya describes two strange cases of chloropy or green-seeing, which he finds can only be due to an extremely delicate change in the chloroidea.

VIERTELJAHRSSCHRIFT FÜR WISSENSCHAFTLICHE PHILOSOPHIE. Vol. XVIII. No. 3.

ZUR THEORIE DER NATURWISSENSCHAFTLICHEN BEGRIFFSBILDUNG. By *H. Rickert.*—UEBER SUBJECTLOSE SÄTZE UND DAS VERHÄLTNISS DER GRAMMATIK ZU LOGIK UND PSYCHOLOGIE. By *A. Marty.* (Leipsic: O. R. Reisland.)

ZEITSCHRIFT FÜR PHILOSOPHIE UND PHILOSOPHISCHE KRITIK, Vol. CIV. No. 2.

DAS WELTSYSTEM DES PARMENIDES. By *A. Döring.*—DIE PHILOSOPHIE IN RUSSLAND. (Conclusion.) By *Jakob Kolubowsky.*—KURZE KENNZEICHNUNG MEINES PHILOSOPHISCHEN STANDPUNKTES. By *Gustav Glogau.*—JAHRESBERICHT ÜBER ERSCHEINUNGEN DER PHILOSOPHISCHEN LITTERATUR IN FRANKREICH AUS DEN JAHREN 1891–1893. By *Adolf Lasson.*—RECENSIONEN. (Leipsic: C. E. M. Pfeffer.)

REVUE PHILOSOPHIQUE. Vol. XIX. Nos. 6, 7, 8, and 9.

LES RÈGLES DE LA MÉTHODE SOCIOLOGIQUE. (Second Article.) By *Durkheim.*—LES ACTIONS D'ARRÊT DANS LES PHÉNOMÈNES DE LA PAROLE. By *A. Binet* and *V. Henri.*—SUR LES DIVERSES ACCEPTIONS DU MOT "LOI" DANS LES SCIENCES ET EN MÉTAPHYSIQUE. (Concluded.) By *L. Weber.*—ORIGINES ET CONDITIONS DE LA MORALITÉ. By *Dr. Pioger.*

LA MÉTHODE PHILOSOPHIQUE DE RENAN. By *G. Séailles.*—LES RÈGLES DE LA MÉTHODE SOCIOLOGIQUE (Third Article.) By *E. Durkheim.*—L'IMPRESSION DE L'"ENTIÈREMENT NOUVEAU" ET CELLE DU "DÉJÀ VU." By *Dugas.*—LA PARAMNÉSIE OU FAUSSE MÉMOIRE. By *J.-J. Van Biervlict.*—LA PARAMNÉSIE, D'APRÈS T. VIGNOLI. By *J. Soury.*—LA THÉORIE DE LA CONNAISSANCE MATHÉMATIQUE (MILHAUD, RENOUVIER, H. POINCARÉ, COUTURAT, HUSSERL, ETC.) By *P. Tannery.*

L'ANCIENNE ET LES NOUVELLES GÉOMÉTRIES. III. LES POSTULATS RÉELS DE LA GÉOMÉTRIE EUCLIDIENNE SONT À LA BASE DES MÉTAGÉOMÉTRIES. By *J. Delbœuf.*—INFLUENCE DE L'ÂGE SUR LA MÉMOIRE IMMÉDIATE. By *Bourdon.*—LES

RÈGLES DE LA MÉTHODE SOCIOLOGIQUE. (Fourth and Last Article.) By *E. Durkheim.*

LE PROBLÈME LOGIQUE DE L'INFINI. II. VALEUR ET GRANDEUR. By *G. Mouret.*—L'IDÉE D'AME DANS L'ANCIENNE ÉGYPTE. SA GENÈSE ET SON DEVELOPPEMENT. By *Amélineau.*—DE LA DURÉE DU TEMPS DANS LE RÊVE. By *J. Le Lorain.*—ANALYSES ET COMPTES RENDUS. (Paris: Félix Alcan.)

The *Revue Philosophique* is devoting much space of late to the theory of mathematical cognition. In the July number M. Tannery, whose book on scientific theories has an established reputation, excellently reviews the opinions, recently promulgated, of prominent philosophers and mathematicians. In the August number Professor Delbœuf continues his discussion of the old and new geometries. He claims that all geometries are founded upon the Euclidean, that the meta-Euclidean geometries are not a generalisation but merely an extension of the Euclidean geometry, and it is by this fact that their legitimacy is guaranteed. Finally, in the September number, we have the second part of G. Mouret's article on "The Logical Problem of Infinity," having for its subject "Value and Magnitude."

REVUE DE MÉTAPHYSIQUE ET DE MORALE. Vol. II. No. 4.

SUR LA NATURE DU RAISONNEMENT MATHÉMATIQUE. By *H. Poincaré.*—RENAN DIEU ET LA NATURE. By *G. Séailles.*—L'UTILITARISME ET SES NOUVEAUX CRITIQUES. By *G. Belot.*—SUR LE CONCEPT DU TRANSFINI. By *P. Tannery.*—NOTES CRITIQUES. (Paris: Librairie Hachette & Co.)

In close connexion with the studies referred to above in the *Revue Philosophique*, is here the celebrated mathematician Poincaré's article on "The Nature of Mathematical Reasoning." In mathematics we jump from special cases to general propositions. Is, then, mathematics deductive? Yes, maintains M. Poincaré, because its apparent induction proceeds by a method of reasoning which may be called recurrent. This mathematical induction is different in some respects from physical induction and is possible only in cases where the same operation admits of indefinite repetition, as in the common scale of numbers and in geometrical space-constructions. Because in chess the same operations do not admit of indefinite repetition, this game can never become a science.

THE RIKUGO ZASSI. No. 164, August, 1894.

REFLEXIONS ON SOME RECENT THEORIES OF HEREDITY. By *S. Goto.*—POPE AND SOCIAL PROBLEM. II. By *E. Ono.*—FOREIGN MISSIONARIES. By *K. Ukita.*—REVIEW OF "ATTACKS UPON CHRISTIANITY." IV. By *T. Harada.*—SCHOPENHAUER'S METHOD OF INTERPRETING THE WORLD-PROBLEM. (Concluded.) By *M. Matsumoto.*—BOOK REVIEWS.

A Japanese philosophical magazine, referred to in the Literary Correspondence of the last *Monist*. Printed in the original Chinese.

VOL. V. JANUARY, 1895. NO. 2.

THE MONIST.

LONGEVITY AND DEATH.[1]

IN CONNEXION with Professor Weismann's very noteworthy essay on *Death*, in my estimation one of the most important contributions to the literature of Natural Selection since Darwin died, it may be of interest if I here quote some passages from an unpublished essay of mine written in 1875 upon the same subject and dealing with it from somewhat the same standpoint—that of adaptation. It will be noticed that these passages for the most part refer to points which are unnoticed by Professor Weismann, and hence may be of use in any further consideration of the problem. The essay was not originally published, as Mr. Darwin, though he expressed his approval of the views it contained, considered them of so "speculative" a character as to render this at that time unadvisable. The passages to which reference has been made are here extracted verbatim.

Mr. Ray Lankester, in his valuable little treatise on *Comparative Longevity*, points out two or three causes which he thinks must have been instrumental in determining for each species what he aptly designates the normal potential longevity of the individual. While

[1] The late Mr. G. J. Romanes placed the manuscript from which this paper is printed among the notes and appendices for his forthcoming Part II of *Darwin and After Darwin*. He bade me exercise my discretion with regard to the inclusion of such notes in that volume, leaving me free to decide whether they should be published in that or in some other manner. In consenting to the appearance of the following pages in *The Monist* I wish to reserve the right of republication in such form as may seem desirable.—C. LLOYD MORGAN.

freely assenting to his opinions, I think there are other and still more important influences which he might have suggested—in particular that of Natural Selection.

If there is any conceivable way in which the agency of Natural Selection can be supposed to have assisted in determining the potential longevity of individuals, I think we have a right to conclude that the assistance so afforded must in all probability have been considerable, for Natural Selection, being of resistless power and constant operation, can scarcely be present anywhere without leaving good work behind it. Now we have, first of all, a strong antecedent probability that survival of the fittest must have had some share in determining the duration of life in individuals; for it is antecedently probable that so important a matter as the length of the individual's lifetime should in some way or another bear upon the interests of the species.

But in what way can the potential longevity of the individual affect the interests of the species? I think it may do so in several ways, as follows:—

Those species whose ancestral types have frequently been required to vary would have gained much during the history of their descent, by having their constituent individuals short-lived; for in this way a comparatively great number of opportunities would have been afforded for the requisite variation to arise: in other words, a comparatively great number of variations would have occurred in a given time. Hence it seems natural to infer that it is in the power of Natural Selection to affect the *curtailment* of individual life, wherever such curtailment would be of advantage to the species, that is to say, wherever *flexibility* of type is required. Of course, length of life is not the only factor which determines flexibility of type. There are at least three other such factors, (1) the period at which puberty sets in, (2) the number of times the individual breeds during its lifetime, and (3) the number of young which it bears at each time of breeding. Nevertheless, it is true that the length of life is a highly important factor, because, if the individual is short-lived, it becomes a necessary condition to the continuance of the species that parturition should be frequent. Or, more generally, there must be more

or less of a direct proportion between the potential longevity of every species and the frequency of parturitions characteristic of that species—if not also of the number of offspring in each. Now, as Mr. Lankester has pointed out, there is, as a matter of fact, a highly remarkable correlation between potential longevity in the individual and frequency of parturition, as well as of numbers constituting the litter which are distinctive of the species. This correlation he attributes to generative expenditure acting directly to the curtailment of life; but in holding this view, I suspect that he is mistaking cause for effect. I do not think it is generative expenditure which causes curtailment of life, but that it is curtailment of life by Natural Selection which causes the high generative expenditure within the lessened period. It is as though all the conditions needed to secure flexibility of type were adaptively associated in these species which have survived in a comparatively fluctuating environment. Moreover, it is worth observing that all the organisms to which Mr. Lankester ascribes a practically unlimited potentiality of life, are organisms which, as far as we can judge, must always have been exposed to uniform conditions of life.

The essay then proceeds to consider death in general as due to adaptive causes, and concludes as follows:

It is too often forgotten by evolutionists that natural selection can only operate before and during the time at which an organism is capable of procreation. After the breeding age is past, the influence of natural selection is entirely withdrawn. For although it is true that a vigorous old age conduces to the longevity of the individual presenting it, he is not able to transmit his senile qualities to progeny, and thus survival of the fittest—which works for the benefit of the race—is in no way concerned with them. Of course senile vigor may be a residual effect of youthful vigor, and thus, as it were, an accidental result of natural selection; but *per se* it is not a result for the direct attainment of which natural selection can ever operate.

So far as this principle is concerned the organism may be regarded as dead so soon as it has ceased to procreate, and although one of the sequelæ of natural selection operating on earlier ages

may be that of increasing the chances of vigor in old age, this, in relation to the objects of natural selection, is merely an incidental concomitant.

Consequently, any diseases which belong to old age will be allowed by natural selection to commit their ravages without let or hindrance, while diseases which belong to all earlier periods of life will be, as far as possible, eliminated. The way in which they are eliminated is by allowing those who succumb to them to die, and thus allowing those who do not succumb to breed—so bequeathing to progeny constitutions which are capable of resisting disease. But all such diseases as apoplexy, angina, etc., which belong chiefly to old age, are quite beyond the province of natural selection to control, for it matters not to the species how soon after the last offspring has been produced the parent organism dies.

Now, if this applies to disease, it must apply equally to normal physiological processes. If natural selection can inspire no hindrance to those abnormal tissue-changes which end in apoplexy or angina, neither can it inspire any hindrance to those normal tissue-changes which lead to death from general decay, or, as it is said, from mere old age. Throughout its life there is perpetually going on in the individual organism a struggle between the processes of waste and repair. Before and during the age of procreation survival of the fittest is in close alliance with the forces of construction. But as soon as the age of procreation is passed, this alliance ceases; the forces of destruction are allowed full play, and therefore more or less rapidly the balance between them and their antagonists is overthrown; the organism dies.

Now, if these things are so, it follows that there ought to be a general relationship observable in all species between the age at which procreation ceases and death supervenes. In other words, individuals of species which breed early, or breed often, ought to die young. The only object which natural selection has in favoring the forces of construction before and during the age of procreation being that of securing the fittest progeny, so soon as the individual has yielded a sufficient number of such progeny, he has ceased to be an object of any concern to natural selection. Therefore, as I

have just said, individuals belonging to species which breed early, or breed often, ought to die young. And this, generally speaking, is what we find to be the case. Indeed, it is the only general principle that can be found to hold throughout both the vegetable and animal kingdoms.

Prof. Ray Lankester, in his essay already alluded to, ascribes this correlation to exhaustion of vital energies in a measure proportional to the amount and rate of propagation. But according to the views here advocated, the correlation is really due to natural selection, and, as such, has a directly adaptive meaning.

GEORGE J. ROMANES.

TO BE ALIVE, WHAT IS IT?

THAT subtile, matter-quickening something we call life, in what does it consist?

The mere mention of its name conjures up a vision of all that is most marvellous in the sense-revealed universe. For the most part it is regarded as a mystery transcending naturalistic conception ; as an alien influx into nature, baffling scientific interpretation. Philosophers, ancient and modern, have declared the vivification of the material composing living beings to be the work of an altogether exceptional, hyperphysical agency. And eminent scientists, satisfied that spontaneous generation nowhere occurs, have conjectured that the germ of life has meteorically descended on our planet from the skies.

It is true, physiologists, not long ago, entertained the hope of solving the problem of vitality by means of the hypothesis of atomic mechanics. It has, however, become more and more evident that vital processes, even of the simplest kind, are not of the mechanical order. But, if not through mechanical agency, through atomic push and counterpush, how then are the activities, the purposive movements of life effected?

The scientific spirit revolts against the facile subterfuge of attributing the occurrence of any obscure event in nature to the miraculous intervention of any kind of extraneous power. It can find restful satisfaction in no sort of conflict between incommensurable agencies. It irresistibly urges towards unification, towards a monistic interpretation. The ever-present intuition, guiding and inspiring scientific investigation, is the firm belief that nature is all-embracing,

that all her phenomena without exception are interdependently connected, are forming part of one all-comprising cosmos.

This steadfastly in mind, the attempt shall here be made, first to gain a scientifically justified and logically consistent physical basis, upon which a naturalistic conception of vitality can be reared; and, then, to show to what special physical conditions vital activities and vital organisation owe their existence.

THE PHYSICAL BASIS.

However inscrutable the vivification of lifeless stuff may appear, the rest of nature, things inanimate, have in a manner become intelligible to us. Thunder and lightning, earthquakes and plagues, are no longer regarded as wilful visitations of living Gods; of Indra or Jahve, of Zeus or Thor, of Ahriman or Jove. We view them as necessary outcomes of the present order of nature. And, therewith, they have lost most of their terrorising influence over us. We can tell whence the wind cometh and whither it goeth; and do not stand confounded before the birth of the storm-laden clouds. We know what "shakes the old beldame earth, and topples steeples and moss-grown towers." And we do not shrink from waging war against all manner of pestiferous scourges. No such portentous heart-beats, as beset the mediæval conscience of Petrarch, oppress us when we ascend heaven-scaling Alps, and behold at our feet the glory of the far-stretching, sunlit landscape. To us the woods bear a familiar aspect. No satyrs or fauns, no mischievous elfs or gnomes haunt their grateful shades. Overhead the sun sheds his majestic light more reliably by far than when all-seeing Helios drove him along. And universal gravitation holds the starry host more trustfully within ordered cycles than could any divine volition of their own.

Our dread of outside nature seems to diminish in measure as we become convinced that nothing vivifies it from within; that its divers constituents, its heaven and earth, its winds and waters, its stocks and stones, are in no way volitionally actuated. The sense-apparent properties of things once probed, we fear not that they will turn upon us with untoward powers. Instead of cringing be-

fore their hidden terrors, we proudly move among them as masters, controlling and utilising their sundry efficiencies. Unlike our savage ancestors, whose religion consisted chiefly in attempts at propitiating malignant influences abroad, we snugly-settled optimists have almost come to believe with Candide that this is indeed the best and most benignant of worlds.

Yet such seemingly close familiarity with the outside universe, and the apparent recognition of its nature, is after all but a fond illusion. All things have in truth become far more enigmatical, far more foreign to our understanding, since we fail to discover any analogy between inanimate activities and our own volitional performances. The saying of Socrates, that physical nature must ever remain incomprehensible to us, while we are competent to recognise our own mental and moral being, while—as he expressed it—the command of the Delphian god, "Know thyself," could and should be obeyed; this agnostic declaration on the part of the wisest of ancients regarding the physical side of nature, may after all not be so completely off the mark as most scientists of the present day would be inclined to acknowledge.

Gravitation, though its mode of occurrence is mathematically precise, acts really by force of something not remotely so well known to us as our own volition. The evolutional drift of the endless preparatory stages of elaboration through which the original stuff of our planet has passed before it became fit to serve as a habitation for living beings; this physical becoming is infinitely less intelligible than the process by which we ourselves make things subserve remote ends. The forces that actuate and shape material things from within are indeed incommensurable with the activity by which we seize upon them from without, to put their given efficiencies to intelligent uses.

Our comprehension of matter and its forces, vicarious or symbolical as it necessarily is, is moreover limited by the scope of our sense-informed imagination. The astoundingly sensitive response of a lifeless wire to the lightning speed of the electrical influx, and to its slightest minutiæ, is incomparably more perplexing to our conception, than, for instance, the rate of the propagation of

the immensely more sluggish current of activity along our living nerves.

Furthermore, it is obviously only by dint of co-natural congruency and sympathy that we come to understand the inwardness of any thing or event whatever. We are well enough aware what it inwardly means when some other living being is seen to be in an angry or in a pleased mood, to be laughing or weeping. But who can grasp with co-natural sympathy the inward meaning, the motive intention of a cyclone or an earthquake, of shining light or falling snow, of physical or chemical activity? We generally rest satisfied when we have ascertained that it all occurs in accordance with definite "laws"; that it all forms part of the "mechanism of nature," of a rigorous concatenation of "causes and effects."

But what scientist has the slightest inkling of that which really constitutes inanimate or physical activity? He calls it force, and believes it is something that can move or energise matter. He calls it energy, and imagines that this immaterial essence of activity—in truth a mere mental abstraction—can slide from one material compound into another, assuming protean modes of appearance. At times he calls it motion, without realising that "motion" is only a perceptual sign of ours for all manner of activities we have no power of intellectually assimilating.

In this helpless predicament some are bold enough to cut the knot by asserting that it is volition which here also is imparting motion to lifeless matter; moving it—as some maintain—from within as will of its own; or—as others will have it—from without by force of the will of some *deus ex machina*. But what legitimate analogy can be found between the conscious, aimfully directed movements of our appropriately organised living body, and the evidently unconscious, purposeless motions of things in which no perceptible sign of animation or volitional direction can be detected?

And if our intellect is powerless to assimilate inanimate or physical activity with what it is cognisant of as animated or volitional activity, our senses fail to yield us adequate information regarding even the effects of such physical activity. We offer our sundry sensibilities as delicately graded reagents to the sense-affecting agents

of the outside world. How marvellous the definiteness of our vision, its close inspection and distant reach, its refined distinction of shades and colors! And what a world of sounds is revealed to our hearing! How sensitive our feeling to grades of heat and cold, to degrees of resistance and weight! How discriminative our tasting and smelling! Yet lifeless glass-lenses, photographic plates, vibrating membranes, thermometers, scales, and chemical reagents innumerable outdo us in the recording and penetration of distinctions obtaining in the material universe. Who can tell what marvels of nature may be taking place beyond the reach of our living senses, even when supplemented by artifical aids? How utterly sense-transcending, for instance, the intimate constitution of bodies, or the real properties of the interstellar medium that transmits to us life-supporting heat and light, and is the bearer of that strange, terrific power we have learned to harness in batteries and dynamos, without the least conception of its real nature.

In order to realise what kind of world it is, in which we move and have our being, it is well not only to live in the light of knowledge attained, but at times also to remind ourselves of regions outlying and unrevealed.

The activities, by whose agency is fashioned in extra-conscious existence that marvellous piece of workmanship we call physical nature, are at least to some extent immediately known to us by means of their effects on our own being, by means of their sense-affecting efficiencies. But of what nature is the existent that proves itself thus active? Activity cannot possibly be self-sustained. It must be the activity of something. Even in Wonderland the "grin" cannot be fancied without the "cat." Just as little can we conceive activity existing and persisting without an acting agent.

What then has our present science to say about this irreducible something which is the acting agent in nature? It generally teaches that the physical universe consists of matter and force; or, more technically expressed, of masses possessing kinetic or potential energy; that is of a statical and a dynamical principle, of a permanent existent serving as vehicle to varying modes of activity, manifest as so many modes of motion or commotion.

Now it is clear, that what affects our senses are only so many modes of activity of that which is active. Peculiar modes of activity affect our sense of touch, other modes our sense of sight, others again our sense of hearing, and so on. And it is obviously only by force of these sundry modes of activity that the acting agents of the physical world make their existence and peculiarities known to us. We cannot rightly say that the existing agents are unknown, for we actually know them by dint of the effects they work in us through their characteristic activities; activities which are essential to their existence, which in fact constitute them specific existents distinguishable from one another. Moreover, the various modes of our sensibility, through which on stimulation we recognise physical existents, are themselves phylogenetically inwrought effects of their activities; or, more correctly perhaps, they are reactive responses attuned to their divers modes of stimulation.

Still the activities are not themselves the acting agents; the properties of the substance not themselves that substance. We cannot rest satisfied with mere physical phenomenism. We are naturally and forcibly led to believe that activities emanate from efficient existents, or so-called bodies. And this because the presence of what by means of our percepts we infer to be such induces changes in other suchwise inferred bodies, and in ourselves as sole consciously realising reagent.

Right here, however, the current conception, that it is the *actually perceived* universe which consists of force-endowed bodies, or masses possessing kinetic or potential energy; this conception gives rise to a knot of perplexities difficult to disentangle. It is clear, as already stated, that all we perceive of physical nature, all its so-called objects, together with their changes, are really effects induced in us solely by its activities. The entire perception, so long as it lasts, is out and out a stimulated effect of a group of unremitting activities. There is nothing enduring, nothing whatever substantial in it. Yet we are wont to detach from this perceptual group of activity-induced effects a comparatively changeless component which we then wrongly conceive as being itself a material body or substance,

constituting it an unchangeable vehicle for less stable and subsiding components of the perceived activities.

When the percept "gold," for instance, is awakened in us by a definite group of physical activities, we generally pick out some of the less changeable of these activities, such as resistance or inertia-force, weight or gravity-force, degree of cohesive force, specific modes of chemical force or reaction, and so on. These less changeable activities we install as the permanent substance "gold," while we allow less stable activities, mainly degrees of molar and molecular motion, to pass over into other physical bodies in the form of what we call energy, an immaterial something deemed to be convertible into other modes of this same immaterial something.

This perceptual and therewith mentally symbolical realisation of extra-conscious things and events, constitutes the principal puzzle encountered by scientific interpretation. Physical science itself, when it goes cautiously to work, likewise only *infers* the existence of bodies, or permanent existents. And this solely by dint of mutual relations obtaining between perceptible activities. When, moreover, it seeks to rid itself of all merely inferred existence, it is apt to become reduced to mere objective phenomenism, and at last to nothing but perceptual space and time-relations. Such pure phenomenism is then meant to be utterly devoid of realistic inferences, devoid of substantiality and efficacy, of actual matter and force.

Yet, however masked, there persist, even here, in mathematical physics of the most abstract kind, inevasibly, the old irreducible realistic postulates, the common-sense assumption of force-endowed existents. For those physical percepts, generally called bodies for the sake of intelligibility, whatever space, large or small, they may occupy in perception or conception, are here necessarily inferred to act upon one another in specific ways, so as to induce definite changes in their space and time-relations. Without this realistic assumption of force-endowed existents,—perceptual phenomena conceived as such in this instance,—physical phenomenism would be incapable of establishing any relation whatever between the perceived changes in the position and velocity of percepts, which changes constitute the sole subject-matter of its investigation.

And it need hardly be mentioned that this attribution of efficacy and therewith substantiality to mere transitory percepts, which in fact and also according to the adopted theory are wholly unsubstantial and forceless; that such procedure involves physical phenomenism in outright contradictions.

Is it not far more justifiable to assume at once that the feeling of effort and resistance we experience when endeavoring to act upon what in conscious representation appears as an immaterial and forceless percept, corresponds in reality to a force and counter-force exerted by physical existents subsisting outside our consciousness? And as our own efficient being in this experience belongs to physical nature as well as other existents acted upon and reacting, we may legitimately infer that all physical existents have power to act upon one another so as to induce changes in their respective dispositions and constitutions.

Physical science, of a less subtile kind than pure phenomenism, is wont to start frankly with the realistic common-sense assumptions. It conceives, however, the physical existents and the activities they display, as two separable factors in nature. In so doing it runs itself into wholly contradictory conclusions. The physical world is thus held to consist, not of force exerting agents, but of inert, force-driven particles; not of existents possessing inherent energy, but of such possessed by energy *ab extra*. This modern conception of modes of energy being transferable and interconvertible, when meant to express an actual fact in nature, stands seriously in the way of a correct interpretation of physical occurrences. It logically reduces the world-material, that forms the endlessly diversified and power-endowed universe, to an utterly passive *caput mortuum*, to a mere space-occupying, qualitatively indifferent vehicle of activities and qualities, believed to be imparted to it by being simply knocked about from without by an immaterial factotum, called energy.

In the whole range of thought there exists no more fanciful belief than that which makes so utterly inconceivable an abstraction as pure energy or motion detach itself from a moving mass to seize upon another mass which it thereby energises.

That there obtains in nature a strict reciprocal equivalence, or invariable quantitative relation, between causes and effects, between changes occurring in interdependent groups of physical existents, of this there can be no doubt. But these changes are one and all the outcome of powers inherent in the manifesting agents, and nowise merely wrought upon them from without.

All physical existents of which nature is composed tend to equilibration of their respective powers or energies. This process of equilibration never deviates from a strictly quantitative as well as qualitative correlation of the changes through which it is attained. The quantitative aspect of these changes is conceived as equivalence, however qualitatively disparate they may prove to be. So much mechanical impact of physical existents induces exactly so much heat-commotion.

Nature is not composed of indestructible matter on one side, and indestructible energy on the other; but of perceptually distinguishable physical existents subsisting under strictly interdependent relations to one another, quantitatively and qualitatively.

We become consciously aware of physical existents solely by their sundry characteristic activities stimulating our senses. And just as certain as these activities merely *stimulate* our senses, nowise passing over into our being, just as certain do these same activities merely *stimulate* changes in other physical compounds without passing over into them.

The greatest triumph of the purely mechanical theory is supposed to have been achieved in the kinetic theory of gases. Yet all the astounding velocity attributed to gas-molecules would speedily come to a standstill, if they were not themselves held to be intrinsically endowed with the master-spring that keeps it all going. For in the words of Newton, "if two equal bodies meet directly in vacuo, they will by the laws of motion stop where they met, and lose all their motion and remain at rest, unless they be elastic and receive new motion from their spring."

It is solely by theoretically endowing the gas molecules with perfect elasticity, that is with an inexhaustible intrinsic power, mechanically equivalent to the entire kinetic energy with which they

ever so often and ever so forcibly collide, that the physical phenomena displayed by gases can be mechanically interpreted. Here the kinetic energy lost by impact is ever newly reproduced by a force inherent in the molecules themselves. Such kinetic energy, therefore, instead of being externally imparted to them, is actually an outcome of their own intimate and inalienable nature.[1]

This state of things being considered as obtaining between the molecules of gases, there is no reason why it should not likewise obtain between solid masses, made up of the same molecules. Therefore, on mechanical impact of two solid bodies the resulting commotion of their constituent particles, felt by us as heat, is just as much an outcome of stimulated elasticity, as was held to be the case in the gaseous state. Only here cohesion acts as a counterforce.

As, even in these foremost examples of mechanical activity, there occurs evidently no actual transmission and conversion of energy, but only equivalent modes of action and counteraction, it stands to reason that this holds good all the more regarding other modes of activity, such as gravitation, cohesion, chemical affinity, magnetism, and so on.

We shall never come to appreciate the wondrous potencies and potentialities inherent in physical existents, unless we relinquish the conception of transmitted and interconvertible modes of energy. All percepts, which constitute for us the characteristics of definite physical existents and their activities under definite conditions, will reappear whenever these existents are brought under the same con-

---

[1] That which goes by the name of kinetic energy is perhaps the strangest of all modes of energy. That a physical existent should be able to acquire unlimited amounts of power to change the state and constitution of other physical existents merely by traversing more space in less time—space and time being conceived as themselves utterly forceless—this fact more than any other brings home to us how much of essential efficiency in nature remains unexplained.

How can an activity, an effect-producing efficiency, impressed upon a mass, impressed upon it without working any change whatever in its own intrinsic condition, how can it become a function of forceless space and time? This would seem to indicate that what in our perception appears as forceless, empty space corresponds in extra-conscious reality to a force-endowed medium, whose actual existence is indeed made evident by the sundry modes of radiant energy.

ditions. This involves the conservation of the physical substratum as well as the conservation of its energies. Or, rather, it reveals its infallible specific constitution and powers under definite conditions.

That all modes of unequiliberated activity manifest themselves to us as so many modes of motion or displacement, is due to the fact that our perceptual sign for every kind of physical change takes the form of motion or commotion of our percepts. It is, therefore, obviously erroneous to conclude that these perceptual modes of motion are the cause of the changes occurring in physical existents. And it is erroneous also to conclude that the activities of physical existents which we perceptually realise as motions are themselves only motions.

When a chemical compound is formed by combination of elements, the process is perceptually realised by us as a commotion among the combining particles. But from the newly acquired properties of the compound, revealed in roundabout ways to our different senses, we rightly infer that specific energies appertaining to the combining substances have been here at work, while we were merely perceiving definite modes of commotion.

The various considerations here brought forward, and many more not here touched upon, allow us to conclude, that changes occurring in and among physical existents, changes perceived by us as motions or commotions of the percepts aroused by their sense-stimulating activities; that these changes are wrought by specific efficiencies belonging to their own intimate nature.

VITALITY AND ORGANISATION.[1]

The general remarks of the previous section were called for in order to establish a position from which a correct co-natural interpretation of "life" may be attained. Scientists have been on the wrong track when they supposed that vital activities could be cor-

[1] The views here expressed are the result of a study of primitive forms of life, carried on during a number of years.

related with the activities of lifeless nature, by simply applying to them the laws of mechanically induced motions.[1]

To arrive at a unitary view of nature, we have, on the contrary, to regard all activities, whether displayed by living or by lifeless existents, as the result of the action and reaction of their own specific energies.[2]

Yet even to casual observation there exists no greater contrast among the constituent objects of nature than that witnessed between living and lifeless things. It is above all the vital phenomenon of self-movement which strikes the sense as something differing altogether from changes undergone by lifeless objects. These seem to be moved only when externally pushed or pulled, while the motions of living bodies seem to be actuated by a power inherent in themselves.

On closer examination the contrast between these two modes of bodily existence becomes even more profoundly marked. The structure of living beings is found to be framed throughout for the attainment of definite ends connected with their own particular welfare. And it is fashioned, moreover, into organs of interaction with special objects and agencies of the outside world, through which these are likewise rendered subservient to the needs and purposes of such beings as are endowed with life. Lifeless bodies, on the other hand, are mere inorganic aggregates of particles, whose struc-

---

[1] Having from my biological standpoint for many years argued against the purely mechanical interpretation, I rejoice to find the objections I have urged corroborated by a professional physicist of the highest standing. Professor Mach, in his remarkably lucid *Science of Mechanics*, translated in a masterly manner by Mr. Thomas J. McCormack, and beautifully published by The Open Court Publishing Company, remarks: "Purely mechanical phenomena do not exist. With dynamical results are always associated thermal, magnetic, electric, and chemical phenomena, and the former are always modified in proportion as the latter are asserted. On the other hand, thermal, magnetic, electric, and chemical conditions also can produce motions. Purely mechanical phenomena, accordingly, are abstractions.

"The view that makes mechanics the basis of the remaining branches of physics, and explains all physical phenomena by mechanical ideas, is, in our judgment, a prejudice." (Chap. V.)

[2] The recognition of specific energies in opposition to Lewes's and Wundt's view of "functional indifference" was urged by the present writer in *Mind*, Vol. V, 1880, under the title "The Dependence of Quality on Specific Energies."

ture is not disposed in a way to conduce to the welfare of the body as an integrant being. Nor are the relations of interaction between inorganic bodies and their surroundings such as result in transforming constituents of the latter into means for satisfying the special wants and aims of the former.

The distinction between living and lifeless bodies extends furthermore and deeper still to the relation in which their minutest constituent elements stand to one another. In living beings the ultimate elements of their structure are not only throughout interdependently connected by specific bonds of union called chemical, but they are, moreover, involved in a definite cycle of changes controlled by the nature and activity of the living individual as an indiscerptible entity. Lifeless bodies, on the contrary, consist of a multitude of separate non-interdependent chemical units, forming a more or less coherent aggregate held together by bonds of union called physical. And whatever displacements their constituent particles may suffer are nowise actuated nor controlled by the nature of the body as a whole. In fact, a living being may be looked upon as one single vast and complex chemical vortex. While lifeless bodies are more or less bulky conglomerates of incomparably less complex molecules.

But the most remarkable of all contrasts obtaining between living and lifeless bodies has yet to be mentioned. A living being begins its existence as a mere rudiment of itself, as a so-called germ. This all but shapeless germ, by a most specific cycle of intrinsically controlled changes, assisted by assimilable matter and other agencies of its environment, develops gradually into a full-fashioned individual, reproducing in rejuvenated form an exact copy of the adult organism from which it was derived. It grows by developmental stages from ovular and embryonic beginnings to perfect stature. It is true a crystal immersed in a solution of its own material may, by a figure of speech, be likewise said to grow. But it does so not by a process of intrinsic assimilation of complemental material, but simply by external accretion of the same material of which it is itself composed. And this its so-called growth leads in no way to the

gradual development of a specifically organised form, but only to an enlargement of the same initial shape.

Another and culminating distinction between living and lifeless bodies widens still more the distance by which they are divided. Biological science leaves no doubt that life on our planet was first manifested by elementary beings whose structure showed no trace of morphological organisation. And it is from such primitive beings that the highest organisms now extant are the marvellously developed descendants. The sundry inorganic substances that enter into the constitution of our planet gained likewise their present molecular constitution gradually under changing cosmical and geological conditions. But the growing complexity of their structure was not, as in living beings, genealogically transmitted from individual compounds to individual offspring. The phenomenon of procreation has no analogous counterpart in lifeless nature.

The scientific problem of life offers thus difficulties transcending immeasurably those encountered in the interpretation of inorganic phenomena. What in verity can be the nature of this most intimate, yet least understood fact of vivification?—this intangible something whose formative potency draws to itself stray stuff from the visible world, coercing it into significant organic arrangement and prescient aimful activity; illuminating, moreover, its tiny air and dust-built habitation with the glow of emotive affections, and a vast expanse of world-revealing visions?

Here again, as in inorganic science, we have no other than sense-awakened data upon which to ground our explanation. Vital phenomena, their morphological appearance and physiological bearings, are all only sense-revealed. And it is almost altogether upon a foundation of nothing but visual percepts, consisting of mere shapes, shades, and colors and their changes, that we have to frame our conception of the astonishingly complex nature of organic beings and their vital activities.

With such eminently indirect and fractional data for interpretation, it seems obvious that a close study of the most primitive, least intricate forms of life, holds out the best hope of arriving at a correct view of the nature of life in general.

When we have under observation living beings of all but homogeneous appearance, possessing no specified organs, no morphological differentiations, and yet performing all essential vital functions, nutritive and depurative, motor and sensory, and moreover growing and procreating; when we have all these vital marvels taking place under our very eyes in their simplest and most transparent aspect; it would seem, that, if the mystery of vitality can ever be solved, it will be by gaining an understanding of the intimate molecular processes that give rise to these fundamental vital activities.

We have before us a substance consisting out and out of well-known inorganic elements, that, unlike other combinations of these same elements, displays those wondrous phenomena which distinguish so characteristically living beings from lifeless things. To what sort of influence does it owe its singular endowments? It is the same influence through which we also are alive.

Has, then, perchance some superefficient power, unrevealed in lifeless nature, seized upon those inorganic elements from without, forcing them to fall into highly intricate combinations and modes of activity, altogether foreign and antagonistic to their own propensities?

Or has it rather been by dint of potentialities inherent in themselves, that, through gradual, toilful composition, these elements have come to form combinations of such intricate nature as are found to display that peculiar cycle of interdependent activities in which life is seen to consist?

In closely watching the least complex beings now extant, such, namely, as display amœboid movements, the physical aspect of vitality discloses itself as a definite, interdependent cycle of molecular occurrences. In selecting suitable specimens it is not difficult to interpret the phenomena under view. The flowing-out from the substance of the protoplasmic individual of more or less numerous, more or less elongated and attenuated processes, or pseudopodia as they are sometimes called, alternating after the lapse of more or less time with their shrinking and reincorporation; this simple occurrence of partial expansion and contraction, ever uniformly reit-

erated, constitutes the fundamental twofold, yet indivisible, action in which vitality essentially consists. All other vital functions are subservient to this central see-saw movement. And it will be shown that its developmental elaboration draws with it the differentiation of the protoplasmic substance into specifically formed and specifically acting tissues and organs.

Our task then is to frame from the data here given a scientific conception of the intimate molecular occurrences that determine this particular activity in which vitality consists. Furthermore to discover the conditions which in the course of organic elaboration give rise to the differentiation and position of the principal tissues and organs of highly developed organisms.

First of all let us ascertain what has happened when a process, vigorously pushed out from the substance of an amœba, is gradually arrested in its onward course, beginning thereupon to shrink within itself, and ending in being reincorporated. In order to witness typical and most instructive cases of this occurrence, such amœboid beings have to be selected as push out slowly long and broad processes.

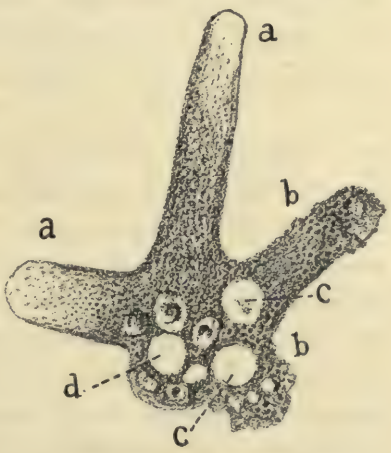

FIG. 1.—AN AMŒBA WITH LONG AND BROAD PROCESSES.

a a. Outflowing processes.
b b. Shrinking processes.
c c. Depurative vesicles gathering the fluid products of functional decomposition.
d. Depurative vesicle gathering the fluid products of nutritive decomposition.

In attentively observing such cases (Fig. 1) it becomes evident that the shrinking of the process is the work of chemical disintegration. It begins at the surface of contact with the medium and extends gradually, and more or less rapidly and completely, towards the centre, or rather the axis of the protoplasmic cone or cylinder. This is clearly evidenced, first by the slackening flow of the granules embedded in the substance near the surface, and then in that portion of the hyaline substratum brought into contact with the medium becoming itself granular. In

favorable specimens it can be easily seen that a process of this kind owes its elongated shape to the stagnating surface forming a lengthening tube, through which the central, still fluent material issues farther and farther into the medium. The proof that the change here observed is in fact the work of chemical disintegration, and not of mere physical modification, is visibly given by vesicles forming within the disintegrating substance, in which are gathered the effete products of decomposition, presently seen to be eliminated.

The influences that are causing this chemical disintegration are readily detected. Any sort of contact or external stimulus tends to decompose more or less profoundly the highly complex and therewith explosive constitution of the protoplasm. During formation of a process an expanding surface is offered to the stimulating influences of the medium, and the ensuing disintegration, accompanied by shrinking or so-called contraction, is obviously the effect of these influences. By means of artificial or supernormal stimulation the shrinking may be accelerated and heightened. Stimulation on the part of the medium may, on the other hand, be called normal or functional, when it does not decompose the protoplasmic substance all too profoundly, that is, beyond easy restitution. Such normal stimulation is indeed an essential and indispensable condition of vital activity. The consequent disintegration of the stimulated substance forms the retrograde or contractile phase of the fundamental vital function. And it was on account of this salient phenomenon of shrinking on stimulation that the living substance has been predominantly regarded as a contractile substance. Furthermore, "irritability" on stimulation, or "sensibility" in case the effect of stimulation was believed to be felt, used to be looked upon as the chief characteristics of life.

The study of protoplasmic individuals teaches, however, that the immediate effect of stimulation gives rise only to the retrograde or negative phase of vital activity. In order that the unitary movement in which life consists may be completed, it has to be complemented by the restitutive, positive phase.

Now as the shrinking or contractile phase of protoplasmic activity proves to be the outcome of chemical disintegration, it is

legitimate to infer that the complemental phase of re-expansion must be the work of chemical reintegration. And this is obviously the case.

Different stages in the elaboration of the living substance manifest themselves through the divers ways in which the fundamental vital activity is carried on, and also through the sundry forms which amœboid individuals in consequence assume. There are specimens which push out long and slender processes, whose substance offers so little restitutive resistance to the disintegrating influences of the medium as to become quickly stagnated through and through, remaining thus often for hours together exteriorised and apparently deadened. Other specimens with just as slender and long processes manage to restitute their substance rapidly enough to be capable of maintaining partially and for a considerable time their fluent state in spite of exposure to the disintegrating influences. It is this more or less rapid play of alternating disintegration and reintegration which imparts to the protoplasm its pulse of life, which constitutes it a living substance.

We have seen by what means protoplasmic disintegration is brought about. How, then, is its re-integration effected?

Let us keep our eye on the exteriorised and seemingly deadened processes of the protoplasmic star (Fig. 2). All sort of stray stuff is promiscuously drifted through its rays. Among numberless particles of foreign matter coming in contact with them only a few are attracted and retained. Through adhesion of many such attracted particles the sharp outline of the processes becomes gradually serrated. Their material undergoes thus progressive restitution through chemical union with this foreign complemental stuff, remelting and shrinking within itself. Several processes in this state of liquefaction meet, coalesce, and form eventually a globule which is drawn into the body, constituting there one of the meshes of the reticulated structure that makes up the outer layer of the little creature's frame. At times a large body, fit for assimilation, gets caught between the rays, which in consequence rapidly dissolve, shrinking so as to form a globule enclosing the foreign body.

Here in this least complicated and undisguised example the

secret of nutrition, and therewith the nature of vital assimilation, so obscure in highly developed organisms, is clearly revealed. Food serves simply as complemental or restitutive material. Its assimilation consists in appropriately filling the chemical gap caused by functional disintegration. The force that underlies this vital reintegration is the avidity of the functionally deteriorated protoplasm to restitute its chemical integrity. A highly complex organic sub-

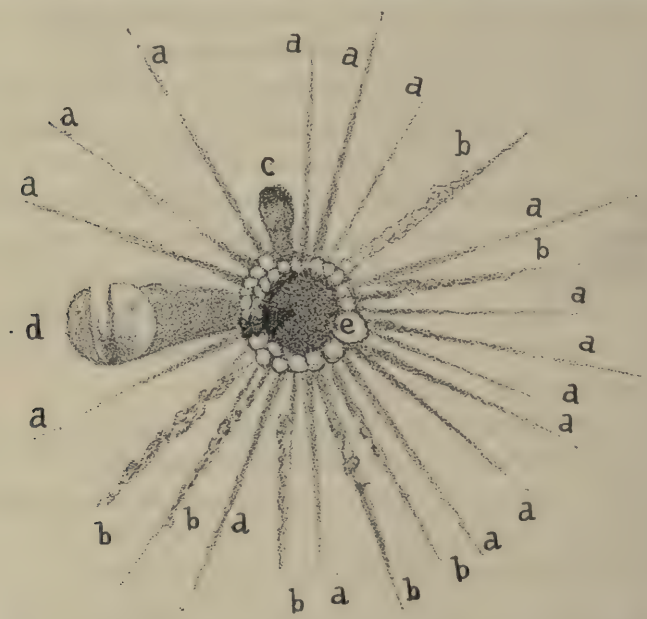

FIG. 2. STELLATE PROTOZOÖN OF WHICH ONLY THE RAYS IN THE FOCUSSED PLANE ARE VISIBLE.

a a. Sharply outlined rays.
b b. Serrated rays with adherent complemental material.
c. A shrinking ray forming a nutritive corpuscle.
d. Foreign organism round which many rays have coalesced, forming a large nutritive corpuscle.
e. A depurative vesicle eliminating periodically fluid products of decomposition
f. Undigested residue of food [dark spot at the base of d].

stance suffers partial decomposition. Thereupon, by force of its own most specific affinities, it reintegrates itself with complemental material.

Add to this, that the waste products of decomposition are eliminated, and you have the threefold, and yet unitary, activity, which in the course of development gives rise to the differentiation of the

complex organism into three main sets of tissues; the first carrying on the functional play with the medium, the second ministering to nutritive restitution, and the third to depurative elimination.

The study of gradations of low forms of life indicates unmistakably that the ectoderm of highly developed organisms represents the morphological elaboration of the relations of the living substance to the sundry stimulating influences of the medium. The entodermic organs constitute the structural fixation of the relations of the living substance to its nutritive or restitutive resources. The office of the depurative organs is, first, to eliminate the waste products of ectodermic function, and then also those of the nutritive function.

To gain an understanding of vitality and organisation, it has to be steadfastly borne in mind, that however intricately differentiated into organs, tissues, and components of tissues an organism may appear, its structure is out and out the visible substratum of this manifoldly related, and yet indiscerptible, activity. It is this indivisibly correlated threefold disposition of the unitary movement of life, that governs organisation from its first beginnings to its most complex development.

It stands to reason that the development of the life of dynamical relations with the medium, or what amounts to the same thing, the development of its structural embodiment in the ectoderm: in neural tissue, muscular substance and sensory organs; that this development calls for more and more highly elaborated restitutive material. While, on the other hand, the growing incongruity of the raw material furnished by the medium for restitutive purposes necessitates a more and more complex series of preparatory processes carried on by means of the elaboration of the entodermic organs: the digesting, blood-preparing, and blood-distributing organs. The depurative organs, meanwhile, lungs, kindneys, and the rest of them, or their more primitive substitutes, keep pace with the general structural elaboration.

The entire developmental process is evidently controlled by the functional play of the organism with its medium. This fundamental process of vital disintegration and reintegration involves nutrition and depuration.

After interpreting vital activity in the simplest manner from directly given data, some more indirect conjectures may be allowed. First, as to the probable origin of life on our planet; and second, as to the general conditions that have conduced to its structural development.

Wherever a complex molecule, formed during the chemical elaboration of our planetary material, suffered slightest disintegration, that is, loss of any of its constituent elements, and was thereupon able to reintegrate itself by means of combination with complemental elements offered by the medium, there life had its beginning. For vitality consists essentially in alternate disintegration and reintegration. No doubt the original molecule that first displayed this primitive vital activity was of an incomparably less complex nature than any vital molecule now extant. But of whatever primitive kind, its alternate disintegration and reintegration raised it from the sphere of lifeless existence into that of living activity.

And now what are the conditions that have resulted in molecular and structural development? Amœboid activity is seen to consist essentially in offering ever-renewed processes to the disintegrating influences of the medium. It may be legitimately conjectured that the stimulating influences have induced, and are still inducing, a specific elaboration of the living substance. By splitting off a definite molecule, they will determine to some extent its reintegration. The pre-established direction of its intrinsic affinities, though marvellously specific, suffers some infinitesimal change through the molecular disturbance generated on each concussion. Instead of restoring with absolute precision its former integrity, the protoplasm incorporates a molecule slightly differing from the one it lost. We know that in plants organic compounds are built up by an analogous process. For elements split off by stimulation there are substituted other elements which go to make up higher compounds than those previously decomposed. Disintegration affords the stimulus whereupon, by dint of affinitive substitution, higher integration takes place. In the laboratory higher compounds are likewise built up on this plan of gradual substitution.

It is, therefore, not far-fetched to conjecture that the highly wrought constitution of protoplasm has been most gradually elaborated by a similar process. And is it not highly probable that the structures of the ectoderm have been elaborated and differentiated through interaction and in accord with the diverse stimulating influences, that actually determine the specific outcome of their functional activity?

It will be well to consider for a moment how radically distinguished living substance really is from non-living material, however highly constituted this may be. The substance that composes a protoplasmic individual forms an indiscerptible whole. It is essentially a chemical unit, for all its constituent parts are held together by most specific bonds of chemical union. Its interdependent vital activities obviously contradict the prevalent notion, that it is composed of a mere aggregate of separate molecules. Such an aggregate of autonomous elements could nowise, save by miraculous intervention, co-operate in effecting the unitary movement of life. Only a substance forming a chemical whole, a substance whose component parts are integrant, and not merely aggregated constituents, can possibly display the manifoldly related, yet indivisible, molecular activity in which life consists. Each of the numberless kinds of amœboid beings assumes a distinct adult form. This clearly indicates that its growth is controlled by the nature of the individual as a whole. It can never be the outcome of the mere cohesive aggregation of a set of chemically non-interdependent molecules. The flow of a protoplasmic process, nay, of an entire protoplasmic individual, in consequence of cumulative reintegration, demonstrates visibly the chemical interdependence of the constituent parts. And so does likewise their shrinking on stimulation. Let the all-pervading bond of chemical union snap, and the material which even now composed the living individual will no longer be a living substance, but a mere deadened lump of organic stuff, rapidly deteriorating into less and less complex fragments of its former self.[1]

[1] What complicates the molecular process underlying vitality, is that each particle of deteriorated protoplasm serves as restitutive material for other deteriorated particles, just the same as food. Two disintegrated processes, for instance, meet

Be it emphatically repeated : every interpretation of life, which makes the unitary activity in which it consists be performed by a number of separate chemical units of whatever kind, gemmules, physiological units, plastidules, biophores, somacules, and eventually cells ; every such mere aggregative interpretation is thereby fatally vitiated at its foundation, and logically forced to invoke miraculous help, in order to actuate and regulate the organic co-operations of so many milliards of separate beings. Strange that the eminent scientific thinkers who have occupied themselves with this question have failed to recognise so patent a state of things.[1]

In illustration of the central fact, that the fundamental and indivisible molecular activity of vital disintegration and reintegration determines not only the mass-motion or motility of the living indi-

---

and coalesce by force of such restitutive affinity. So in gradually dying protoplasmic individuals restitution by means of complemental combination of different portions of the protoplasm goes along with its eventually fatal disintegration. This happens when the conditions that cause disintegration preponderate. When, on the contrary, even after profound disintegration, the restitutive conditions gain the ascendency the individual recovers gradually its full integrity through combination with complemental material derived from the medium. All this is readily and most strikingly observed in artificially slicing protoplasmic individuals.

[1] So far as "cells" are concerned, the continuity of their protoplasm, and its importance as a clue to the understanding of the unity of the organic individual, is being more and more fully recognised by leading biologists.

"Nach dem Mitgetheilten kann nicht, wie es nach den älteren Anschauungen der Fall sein sollte, der Körper als ein blosses Conglomerat von Zellen angesehen werden, die durch ihre Membranen völlig von einander abgeschlossen und in ihren Existenzbedingungen ziemlich unabhängig von einander sind, es bestehen vielmehr in den Geweben und Organen so zahlreiche Verbindungen zwischen gleichartigen und ungleichartigen Zellen, dass es vollkommen gerechtfertigt ist, den ganzen Körper als eine einheitliche Masse lebender Substanz, als ein Synplasma aufzufassen." *Real-Encyclopädie der gesammten Heilkunde*, Professor Karl Frommann, Article 'Zelle,' 1890.

"Bis vor Kurzem nahm man an, dass die Plasmakörper der Pflanzenzellen durch die Zellwände vollständig getrennt seien und in keinem Zusammenhang mit einander stehen. Man musste sich fragen, wie ein Zusammenwirken einzelner Zellen im Dienste des Gesammtorganismus unter solchen Umständen möglich sei und die Pflanze als Lebenseinheit dabei zu Stande komme. Dieses Problem fand seine Lösung in der Entdeckung, dass die einzelnen Plasmakörper der Zellen durch feine protoplasmische Fäden verbunden sind. Diese feinen Fäden durchsetzen die Wände, reichen von Zelle zu Zelle und bedingen in solcher Weise, dass die lebendige Substanz einer Pflanze thatsächlich zusammenhängt, dass somit die Pflanze, ähnlich wie das Thier, einen einheitlichen, lebendigen Organismus bildet." Prof. Eduard Strasburger, *Rede zum Antritt des Rektorates, etc.*, 1891.

vidual, but also its essential form, as well as its main functions, ectodermic, entodermic, and depurative, together with the definite position of the special portions of protoplasm that carry on these functions; in illustration of this cardinal fact let us examine the highly developed, yet out and out fluent, protoplasmic individual, Fig. 3.

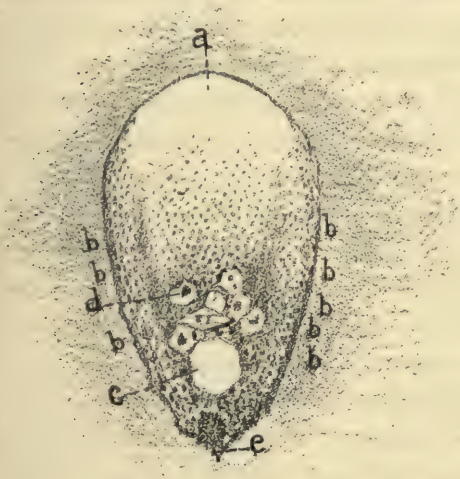

Fig. 3.—An Ovoid Amœba.
a. Hyaline material issuing from granular matrix.
b. Disintegrated protoplasm-forming envelope.
c. Depurative vesicle.
d. Food deposit.
e. Undigested food-residue.

A clearly outlined ovoid being is seen to flow evenly across the field of the microscope. It may be detected at a glance that it embodies all essential features of organisation, but organisation not yet structurally fixed. Though throughout fluent, it maintains a definite shape. It is bilaterally symmetrical. It has an oral and an aboral pole, an incipient ectoderm, a digestive entodermic substance, a depurative vesicle; all occupying definite positions determined by the indivisible cycle of activities that constitute its vitality. It takes in food only in front, retains it until digested in the centre of the body, and eventually evacuates the residue at the aboral pole.

Much of the scientific mystery attaching to vitality and organisation will be dispelled on attentively watching their manifestations in this most favorable protoplasmic specimen. We have here a living being consisting of nothing but fluent substance, exhibiting a localised distribution of all essential vital functions. It constitutes a veritable vortex of vital activity, maintaining amid constant molecular change its original constitution; advancing, moreover, steadily headforemost through space. All the differently functioning regions of this vital vortex receive their specific character from

the peculiar position they occupy in the cycle of molecular activity that constitutes living substance.

From the neighborhood of the digesting protoplasm within the body there issues a continual flow of finely granulated material; and farther in front there emerges from this granular matrix a perfectly hyaline substance. This foremost product of cumulative integration presents thus an expanding surface to the medium. Suffering at last disintegration, it is thrust aside by the bursting forth of new expanding material and slides down along the outer surface, helping there to form the gradually contracting envelope; closing in, at last, in the rear completely collapsed, and ready to re-enter by means of complemental restitution the ascending current. It is by means of this cycle of definitely interdependent activities that the form of the organism is maintained. Food coming in contact with the substance in front gets wrapped up in a coat of protoplasm and is lodged with the same as a nutritive corpuscle in the centre of the body.[1] Between the disintegrated protoplasm gathered in at the rear and the stationary deposits of nutritive corpuscles, generally one single depurative vesicle ministers both to functional and to nutritive depuration.

This beautiful and highly instructive organism has to be looked upon as forming one single process, through the apex of which a renewed flow of hyaline material is ever maintained. In this manner only is its steady locomotion effected. This is visibly demonstrated, and all other attempted explanations of amœboid motility are therefore erroneous.

It is evident that the apex, and after it the circumference are the chemically most complex parts of the protoplasmic individuals. And it is no mere coincidence that in highly developed organisms their surface is found to consist of the most essential organic structures. These have been formed so as adequately to respond to the

[1] In the course of protoplasmic elaboration one portion directly combining with food and lodged inside the body comes to prepare restitutive material for another portion which is thereby enabled to assume exclusively the dynamical relations with the medium. In this manner a digesting part of the common protoplasm becomes subservient to a moving and functionally stimulated part; the entoderm subservient to the needs of the ectoderm.

sundry stimulating influences of the medium. The headmost part of the living substance may well be said to represent the consummation of all the vital labor performed within the living individual. It is, therefore, intrinsically best fit to enter into higher relations with the stimulating influences. It is in fact an incipient head.

As regards the power of vital reproduction, the marvel of marvels of organic nature, its most primitive modes of occurrence will allow us to penetrate its secret to some extent. The fact that a protoplasmic individual has to be looked upon as a chemical unit, which on disintegration tends to restore its full integrity by means of combination with complemental material, gives us the clue to the secret of reproduction.

Growth has then to be conceived, not as a mere multiplication of separate organic molecules, but as the gradual reintegration of a fragment derived from an adult organism. This, in fact, is unmistakably demonstrated in the reconstruction of specifically formed adult shapes from artificial sections of the same. Also, normally, in fissiparous division, where the upper half of a dividing individual has to reconstruct its lower half, whilst, *vice versa*, the lower half is reconstructing its upper half. How, short of miraculous intervention, could any sort of mere multiplication and aggregation of separate molecules ever accomplish such a feat? A reproductive germ is essentially a chemical fragment of the adult organism, which by force of its most specific indwelling affinities has power to reconstitute itself to full integrity.

The interpretation of the fundamental facts of vitality and organisation here given may be found serviceable as a means of unravelling the scientific difficulties of complex organisation.[1] Investigators, who in future will thread their way through its labyrinthine intricacies by help of this clue, may be less likely to lose their bearings.

EDMUND MONTGOMERY.

---

[1] This has been attempted by the present writer in the case of Infusoria, "Ueber das Protoplasma einiger Elementar-Organismen" (*Jenaische Zeitschrift für Naturwissenschaft*, Bd. XVIII, N. F. XI); and also in explanation of muscular activity, "Zur Lehre von der Muskelcontraktion" (*Pflüger's Archiv f. d. gesammte Physiologie*, Bd. XXV, 1881).

THE ADVANCEMENT OF ETHICS.

BY the "advancement of ethics" we mean two things:

I. Substitution of universalism for individualism, as the ground-principle of ethical theory. That is, scientific development of the truth, now everywhere admitted as a truism, that society is an organism—that the life of the individual and the life of society are one organic life, and possess no ethical significance except as lived each in and through the other.

II. Substitution of objective justice for all merely subjective considerations, as the ground-principle of ethical practice. That is, on the one hand, recognition by the individual of the social ideal as the "higher law" of all individual conduct, and, on the other hand, recognition by society of the personal ideal as the "higher law" of all associated conduct; in other words, free self-government of the individual by the social ideal, and free self-government of society by the personal ideal, as the only possible means of realizing the peculiar and complex ethical constitution of the community as an organism of persons, of which the paramount law is equal objective justice.

I.

No ethical theory could possibly exclude from recognition the great fact of society, since, in the last analysis, all ethical relations are social relations. Philosophy may possibly be (though it has never yet consistently been) idealistic; but, by the confession of idealists themselves, ethics must be realistic, and it can never take on a thoroughly scientific character until it knows its own philosophical ground to be realism pure and simple. The reason is self-

evident. Ethical relations are possible only among ethically constituted beings, that is, persons, each of whom must exist, and be known to exist, "in and for himself;" but this principle of equal independence and reciprocal objectivity among co-existent persons is, just so far, "realism" in the philosophical meaning of the word. Hence no ethical theory has ever been presented which did not recognize the real existence of human society as its own necessary presupposition, and find in that real existence the possibility of its own existence as a theory.

The difference between universalism and individualism in ethics, therefore, is not that between affirming and denying the fact of human society, which is the universal and necessary foundation of all ethical systems. The difference lies in differently conceiving the ultimate purpose or ideal end of human life in general. All ethical systems are individualistic which identify the ultimate end of individual life with the *ethical welfare of the individual as such*—all are universalistic which identify it with the *ethical welfare of society as a whole in which the individual is a part.* The difference is a difference of moral ideals. To make this plain, and to show that the advancement of ethics, both theoretical and practical, requires adoption of the larger ideal, is the aim of the present article.

II.

That the prevailing tendency of ethical systems, whether as considered in themselves or as illustrated in the actual life of the world, has been hitherto individualistic, not universalistic, appears alike from the history of ethical speculation, from the conduct of mankind at large, and from the traditional exclusion of politics from ethics both in theory and in practice. Nay, it appears with great distinctness in the essential conception of the science of ethics itself, as defined by one of the highest modern authorities in this department: "Physics is concerned with what is, has been, or will be; ethics with what is 'good,' or what 'ought to be,' and its opposite. We must add, however, that the good that ethics investigates is 'good for man,' to distinguish it from universal or absolute good, which is the subject-matter of theology or ontology; and again, if

we are to separate ethics from politics, we must introduce a further qualification, and define the former as the study of the Good or Wellbeing of men considered as individuals. . . So again the connection between ethics and politics is naturally very intimate. . . Still it is manifest that the good of an individual man can be separated as an object of study from the good of his community; so that the ethical point of view has to be distinguished from the political, however large a field the two studies may have in common. . . To sum up, the subject of ethics, most comprehensively understood, includes (1) an investigation of the constituents and conditions of the Good or Wellbeing of men considered individually, which chiefly takes the form of an examination into the general nature and particular species of (*a*) Virtue or (*b*) Pleasure, and the chief means of realizing these ends; (2) an investigation of the principles and most important details of Duty or the Moral Law (so far as this is distinguished from Virtue); (3) some inquiry into the nature and origin of the Faculty by which duty is recognized; (4) some examination of the question of human Free Will."[1] Here the exclusion of politics and sociology from the proper field of ethics, and the limitation of strictly ethical consideration to the individual as such, are sufficiently manifest.

A glance at the history of ethics confirms Professor Sidgwick's statement, so far as it relates to the past. The pagan ideal in general was strictly an ideal of the individual as such, *totus, teres, atque rotundus.* In the Orient, ethics culminated in the attributes of the "superior man" of Confucius and Mencius, and in the Buddha or "awakened man" so tersely described and vividly pictured in the last two verses of the Dhammapada:

"The manly, the noble, the hero, the great sage, the conqueror, the guileless, the master, the awakened, him I call indeed a Brâhmaṇa. He who knows his former abodes, who sees heaven and hell, has reached the end of births, is perfect in knowledge and a sage, he whose perfections are all perfect, him I call indeed a Brâhmaṇa."

The main object of ethical speculation in Greece and Rome was to determine the essential qualities of the "sage" or "philosopher"

[1] Prof. H. Sidgwick, art. "Ethics," *Encyclopædia Britannica*, 9th ed.

—the ideal man in whom was to be realized actually (ἐνεργείᾳ) the universal humanity inhering potentially (δυναμει) in each human individual. In this Græco-Roman ideal of the "universal individual" as the "sage," the student of history will at once recognize a perfectly consistent application to ethics of the central conception of Greek philosophy, which, germinating in Socrates and Plato, found its ripened expression in the theory of universals or leading metaphysical principle of Aristotle: namely, that the pure universal, or Form, inheres in the individual, or union of Form with Matter, as at once efficient cause, final cause, and formal cause or constitutive essence (τό τὶ ἦν εἶναι, οὐσία). The essential marks of the "sage" were variously conceived by conflicting schools; but, however conceived or named, whether by Platonists, Aristotelians, Cynics and Stoics, Cyrenaics and Epicureans, Neo-Pythagoreans, Neo-Platonists, or what not, the various constituent rays of human perfection came to a focus solely in the typical individual as such, in the "sage" or Perfect Man, and, being essentially individual attributes or qualities, were inapplicable to society except as a mere arithmetical sum of individuals as such. Similarly, the ethical ideal of Christianity from the beginning has been still an ideal of the individual as such—the "saint," the ideal Perfect Man prefigured by the traditionally real Perfect Man of Palestine; while the constitution of its politico-social ideal of the "kingdom of heaven" is too intimately blended with supernatural elements to admit, perhaps, of a rigorously philosophical treatment.

Omitting particular mention (for which there is here no room) of the numerous ethical systems of the modern period, it must suffice for present purposes to point out that the two great schools of modern ethics, the intuitional or disinterested and the associational or utilitarian, agree in limiting the proper sphere of ethics to the conduct of the individual as such, who is to be conceived ideally either as the "good man" or as the "happy man"; and that they divide merely on the question whether the ultimate ground of the individual's moral activity should be (1) disinterested individual intuitions of absolute right or (2) interested individual calculations of utility or expediency. In the one case, the only recognized ethical pur-

pose of life is to be individually "good,"—in the other case, to be individually "happy"; but, in both cases, in the former no less than in the latter, the only ethical end is inevitably reflected back at last upon the Self, and cannot be ultimately realized except in the individual as such.

It is clear, however, that, judged strictly by its own principles, the disinterested school fails to be consistently disinterested and the utilitarian school fails to be consistently utilitarian. On the one hand, when the individual makes his own goodness the supreme aim of his life, he is evidently not disinterested, however exalted may be the form which his self-interest or self-love may assume. Even "virtue for virtue's sake," if *my* virtue alone is my aim, becomes necessarily, in fact, merely "virtue for *my* sake." Clearly, I cannot reach disinterestedness on any such line as that, or on any self-returning line. The intuitionist's criticism of the utilitarian tellingly recoils upon himself; "Self is the centre of his system; regard for self shapes and colors it from first to last. The 'Ethics' are Aristotle's answer to the question, 'How is man to be happy?' It is a lofty selfishness. There is nothing sordid, nothing gross about it. It marks as by a high-water line how high ideal selfishness can be raised. But it is genuine, unalloyed selfishness, and this lies at the very core of the philosophy."[1] On the other hand, in order to avoid a naked and brutal egoism, the more recent utilitarianism sets up quite arbitrarily the "greatest happiness of the greatest number," or some other combination of the "general happiness" with "individual happiness," as a genuinely utilitarian ideal, in the vain hope of effecting a "compromise" between egoism and altruism. For instance, Mr. Spencer lays down this as his universal principle in ethics:

> "No school can avoid taking for the ultimate moral aim a desirable state of feeling called by whatever name—gratification, enjoyment, happiness. Pleasure somewhere, at some time, to some being or beings, is an inexpugnable element of the conception. It is as much a necessary form of moral intuition as space is a necessary form of intellectual intuition."[2]

[1] Rev. I. Gregory Smith, *Chief Ancient Philosophies—Aristotelianism*, London, 1889, p. 46.

[2] *Data of Ethics*, p. 46.

Utilitarianism, then, requires me *invariably to will happiness.* But Mr. Spencer thus states his "compromise":

"Clearly, our conclusion must be that general happiness is to be achieved mainly through the adequate pursuit of their own happiness by individuals; while, reciprocally, the happinesses of individuals are to be achieved in part by their pursuit of the general happiness."[1]

This "compromise" works well enough, so long as, in willing the general happiness, I will, also, my own happiness. But, in every test instance of real (not merely apparent) self-sacrifice, I am compelled to will either (1) my own happiness at the expense of others, or (2) my own unhappiness for the benefit of others. In the first case, I do not will the general unhappiness: if this follows, it is brought about against my will by the natural law of cause and effect; I may deplore it, and suffer, through sympathy, some diminution of the happiness I will. But, in the second case, I positively will my own unhappiness, which has no cause whatever save my own volition. Consequently, since utilitarianism requires me *invariably to will happiness*, it requires me in every test instance *never to will my own unhappiness*, no matter what becomes of others beyond the sphere of my own will; it can never require me to will *contrary* to what it declares so emphatically to be the "ultimate moral aim." This is total collapse of the "compromise"—reduction of utilitarianism to that naked and brutal egoism which it seeks in vain to avoid, and which is the inexorable condition of its own self-consistency. When utilitarianism teaches that happiness as such is the "ultimate moral aim" and that goodness is merely one among many means to this supreme end, it follows that by no possibility can I find a reason in utility why I should even postpone, much less sacrifice, the most beggarly fraction of my own pleasure to the massed bliss of all mankind. If I am of a sympathetic temperament, I may indeed find a utilitarian reason for apparent (not real) self-sacrifice; but, if, like multitudes, I am naturally unsympathetic, the principle of utility requires me to will the only happiness I can understand, and buy a moment's delight at the possible cost of misery to mil-

[1] *Data of Ethics*, p. 238.

lions. To a consistent utilitarianism, the "greatest happiness of the greatest number" is an impossible ideal, unless the "greatest number" is "Number One."

Two modern systems, however, from their exceptional importance, demand a brief special mention.

Kant, perhaps more weightily and impressively than any other philosopher since Aristotle, lays the supreme emphasis in ethics on the individual as such. "Nothing in all the world, indeed nothing outside of it," he declares, "can possibly be held to be unqualifiedly good, with the single exception of a *Good Will.*"[1] Duty he defines as the necessity of performing every action out of pure veneration for the moral law;[2] and the law of duty itself he formulates in the world-famous "categorical imperative," which (be it noticed) is addressed to the individual, and to the individual alone: "So act, as if the maxim of thy action were to become by thy will a universal law of Nature."[3] This principle that "the will of every rational being" is "a universally legislating will"[4] is still further explained as follows:

> "The will, therefore, is not simply subjected to the moral law, but so subjected that it must also be considered *as self-legislating*, and as subjected to the law for that very reason above all, since it must be itself regarded as the original author of that law."[5]

It may strike the reader, perhaps, that, just as no Congress, Parliament, or other legislative body, can irrevocably bind either itself or its successor, so no autonomous will at one moment can bind itself irrevocably at another moment—that the power to enact is, likewise, the power to repeal; and it may seem strange to him that Kant should overlook so formidable an objection. But, according to Kant's profound thought, the individual will which legislates or enacts so absolutely its own moral law is not precisely the same individual will which is bound by that law: the *legislative will* is that

---

[1] *Grundlegung zur Metaphysik der Sitten*, Werke, IV. 241, ed. Hartenstein.

[2] Ibid., p. 248.

[3] Ibid., p. 269, cf. Werke, V. 32, VII. 22, 192, and *passim*

[4] Werke, IV. 279.

[5] Werke, IV. 279.

of the universal I, the universal rational will or abstract humanity (*homo noumenon, die reine Vernunft*) which is immanent in the individual as such, while the *subject will* is that of the empirical I, the concrete individual himself (*homo phaenomenon, der mit Vernunft begabte Sinnenmensch*); and Kant himself calls attention to this "twofold personality" or "doubled self" of the I, when it is compelled to appear in the court of conscience as at the same time both Accuser and Accused.[1] Whether this subtile distinction is successful or not, Kant's ethical principle is perfectly plain: namely, that the individual as such, in virtue of the universal humanity immanent in him, is the sole and absolute source of the universal moral law, by which he freely binds himself and by which he himself is yet necessarily bound—in other words, that there is no moral law at all, either above him or in any sense outside of him, by which he either is bound or can possibly be bound in the least degree. This central conception of *a universally self-legislating individual as such* is not only laid down by Kant as the cardinal principle of his entire ethics, but also made to explain the failure of every antecedent ethical system:

"When, therefore, we look back upon all previous efforts ever made to discover the principle of morality, there is no cause for wondering why they have all without exception failed. It was seen that, through his duty, the individual is bound by the moral law; but it occurred to no one that the individual is subjected to a legislation which is *solely his own* and yet *universal*, and that he is only bound to act according to a will which is at once his own, and yet, by Nature's plan, universally legislative. . . I will therefore call this fundamental proposition the principle of *Autonomy*, in contradistinction to every other, which I will for this reason describe as *Heteronomy*."[2]

It is easy to perceive that Kant's cardinal principle of "Autonomy,"—that is, the immanence in each individual man of the supreme legislative will of universal humanity, as the exclusive seat and source of all moral obligation,—is only a new application of a very old principle, only an application to ethics of the Aristotelian theory of universals in metaphysics. To Aristotle, as we saw above, the pure universal, as Form, inheres in the concrete individual, as

[1] Werke, VII. 245, footnote.

[2] Werke, IV. 281.

union of Form with Matter; and this principle of the inherence or immanence of the Universal in the Individual, as its self-evolving essence and self-realizing end, is Aristotle's original and characteristic theory of universals—perhaps the most potent and fruitful theory ever propounded in philosophy, for it has dominated the entire development and written itself out legibly in the entire history of subsequent speculation. Similarly, to Kant, as we have also seen, the pure universal, as Rational Will, inheres in the concrete individual, as union of Rational Will with Sensibility (in Kant's own precise and pregnant phrase, *der mit Vernunft begabte Sinnenmensch*); and this is Kant's probably unconscious application to ethics of the Aristotelian metaphysics. The undeniable fact, therefore, that his whole ethical theory revolves about the individual as such, is now seen to have a rational explanation, and at least an historical justification, in the other undeniable fact that all modern philosophy has sprung from the Aristotelian root.

Hegel, the great thinker in whom German idealism came to its culminating point, was essentially the historical continuator of Kant through Fichte and Schelling, and renders this general relationship very apparent in his ethical theory. He, too, makes the individual as such the heliocentric fact of ethics, and, no less than Kant, proclaims in the most unqualified way the "Autonomy" of the individual will as Conscience:

"One may speak of abstract Duty in very exalted general terms, and this mode of speaking elevates the individual and expands his heart; but, when it arrives at nothing definite, it becomes at last tedious. The mind demands some particular application, to which it is entitled. On the other hand, Conscience is that deepest inward solitude with oneself, that absolute retirement into oneself, in which everything external, everything definite, vanishes. The individual, as Conscience, is no longer shackled by particular aims, and this, consequently, is a lofty standpoint, a standpoint of the modern world, which has first reached this consciousness, this submersion in oneself [that is, this self-extinction of the sensuous in the rational individuality]. The preceding more sensuous ages have before them something external or given, whether Religion or Right; but Conscience knows itself as Thought, and knows that my own thought is that which alone imposes on me a moral obligation [*dieses mein Denken das allein für mich Verpflichtende ist*]. . . 'Conscience' expresses the absolute title of the subjective self consciousness, namely, to know *in itself* and *from itself* what is Right and Duty, and to recognize nothing else than

what it thus knows as the Good, maintaining at the same time that what it thus knows and wills is Right and Duty *in truth*. Considered as this union of subjective knowledge and objective existence in and for itself, Conscience is a sanctity which it would be sacrilege to assail."[1]

In these unequivocal and emphatic terms, Hegel declares the absolute ethical independence of the individual as such. He, like Kant, makes the individual a universally self-legislating will, concentrates all moral obligation in its self-imposed law, and thus denies even to the "objective spirit," the universal reason of the world as objectified in the State, any ethical authority over the subjective conscience of the individual as such. The individual conscience may be, and often is, deluded; it is by no means infallible; but it is, nevertheless, Hegel's absolute and ultimate appeal in ethics. To be sure, he immediately proceeds to add:

"Whether, however, the conscience of a particular individual is in accordance with this idea of Conscience,—whether that which it holds or declares to be good is also really good,—this is known solely from the *content* of what is thus held or declared to be good. What is Right and Duty, considered as that will-determination which is rational in and for itself, is not essentially the particular property of an individual and does not exist essentially in the form of feeling or any individual (that is, sensuous) knowledge; it exists essentially in the form of *universal* determinations of thought, that is, in the form of *laws* and *rules*. The individual conscience, therefore, is subjected to this judgment, namely, whether it is *true* or not; and its appeal merely *to its Self* is immediately opposed to that which it intends to be—the rule of a mode of conduct which shall be rational, universal, and valid in and for itself. For this reason the State cannot recognize the conscience in its peculiar form as *subjective knowledge*, any more than science can concede validity to mere subjective opinion, assertion of or appeal to mere subjective opinion."[2]

Hegel goes on, later, to define the ethical conception of the State as follows:

"The State is the rational in and for itself, considered as the reality of the substantial *Will*; and this reality it has in the particular *Self-consciousness*, exalted to its own universality [i. e. Kant's universally self-legislating will]. This substantial unity is the absolute and unmoved aim of the Self, in which freedom comes to its highest right; just as this same substantial unity, the final aim of Society, has

---

[1] *Philosophie des Rechts*, Werke, VIII. 177–181.

[2] Ibid., p. 181.

the highest right against individuals, whose *highest duty* it is to be fellow-members of the State."[1]

Further:

"The State has the right and the form of self-conscious and objective rationality, the right to enforce it and to maintain it against contentions which arise out of the *subjective* form of truth, with whatever confidence and authority this may envelop itself."[2]

All this sets up the State as another absolute and ultimate authority in ethics, as an objective, universal, and rational will which has the right to enforce itself against the subjective will of any individual. But, clearly, what we have here, as Hegel's highest teaching in ethics, is the mere possibility of a deadlock of wills, an irreconcilable conflict of wills between the individual and the State. This conflict, this deadlock, is left absolutely without remedy, because there is no higher will—because to Hegel the State, as "objective spirit," is itself the highest will of all: in his own words:

"The State is the reality of the ethical Idea,—the ethical Spirit, as the *manifest*, self-clear, substantial Will, which thinks and knows itself, and executes what it knows and in so far as it knows it."[3]

True, it is the individual's "highest duty," as we have seen, "to be a fellow-member of the State," provided, however, that he himself recognizes it as such. But if otherwise, if he fails to recognize it (and there are to-day too many sincere and honest anarchists to permit such a supposition to be impatiently poohpoohed), then Hegel gives *no moral reason whatever* why the individual should submit his thought to the thought of the State or his will to the will of the State; for he declares unqualifiedly that "my own thought is that which alone imposes on me a moral obligation." In that declaration lies the quintessence of anarchy, as the fundamental principle of the Hegelian ethics,—the apotheosis of the individual as such, and the absolute overthrow of the State. Even in deciding whether the individual conscience "is true or not," the individual himself is Hegel's final appeal: the individual must answer that question *for himself*, and all that the State can do is to crush him.

[1] Ibid., p. 313.
[2] Ibid., p. 343.
[3] Ibid., p. 342.

For it has no higher authority to invoke than absolute brute force; the legislation of the "objective spirit" cannot supersede the absolute self-legislation of the individual conscience, as the ground of individual conduct; the universal human reason which realizes itself in the domestic, civil, and political constitution of the State has no moral authority over me, if "my own thought is that which alone imposes on me a moral obligation." Hence Hegel well epitomizes his ethics of individualism in these significant words: "At the apex of all actions, even including world-historical actions, stand *Individuals*, as subjectivities which realize the substantial [i. e. the universal and substantial will of the objective spirit]."[1]

It is no accident, therefore, that the inadequacy of the Hegelian conception of the organic State—"the State," he says, "is an organism, that is, the development of the Idea in its differences"[2]—betrays itself in Hegel's strange and strained identification of the social ideal with the actually subsisting state of society, or rather in his somewhat contemptuous dismissal of the ethical ideal altogether. The general maxim of his philosophy, that "whatever is rational is real and whatever is real is rational," when applied to his ethics, might well read, "whatever is good is real and whatever is real is good." This is certainly the spirit and drift of such utterances as these:

"The separation of Reality from the Idea is particularly fascinating to the mere understanding, which mistakes the dreams of its own abstractions for something true, and is vain of its *Ought*, which it is specially fond of prescribing in the field of politics, as if the world had waited for the mere understanding to learn how it ought to be, but is not; if the world were as it ought to be, where would the understanding's precocity find room for exercise? . . . Philosophy has to do with the Idea, which is not so powerless as merely to know an Ought and not also to be what it ought."[3]

And again:

"Like empiricism, philosophy, too, knows only what is: it knows no such thing as what merely *ought* to exist, and therefore *does not* exist."[4]

---

[1] Ibid., p. 434.
[2] Ibid., p. 331.
[3] *Encyklopädie*, Werke, VI. 11.
[4] Ibid., p. 80.

Since ethics, as Professor Sidgwick has well defined it above, deals solely with "what is 'good' or what 'ought to be,' and its opposite," one may well ask how such a philosophy as Hegel's comes to have any ethics at all. Such ethics as it has, however, revolves in the last analysis about the individual as such: for the ostensible subordination of the individual to the "objective spirit" means nothing, when the ultimate appeal against the aberrant "subjective conscience" of the individual lies necessarily, as we have seen, to the individual himself.

It is just as easy to perceive in the case of Hegel as in the case of Kant, that the root of all this ethical individualism is the old Aristotelian theory of universals in metaphysics. Hegel's fundamental principle is that the universal is real in the individual alone, and that the individual is real in so far only as it realizes and contains the universal: the universal is in the individual, *because it inheres in it as its immanent self-determining essence*, and the individual is in the universal, *so far, and so far only, as it is subsumed under it as the one universal nature or essence of all individuals*. Insight into this principle is the key to all comprehension of Hegel. He expresses it plainly enough over and over again. In the logic, for instance, he says of the Notion:

"Its *universal* nature gives external reality to itself through *particularity*, and thereby, and as negative reflection into itself, makes itself an *individual*. Or, conversely, the Real is an *individual*, which raises itself through *particularity* into *universality*, and makes itself identical with itself."[1]

Similarly, in the ethics, explaining his definition of the State as "that which is rational in and for itself," he says:

"Considered abstractly, rationality consists in general in the all-interpenetrating unity of universality and individuality; and here, considered concretely according to its content, it consists in the unity of (1) objective freedom, that is, the universal substantial will, and (2) subjective freedom, as the individual knowledge and its will, seeking particular aims. For this reason, according to its form, rationality consists in an activity determining itself according to laws and rules which are *thought*, i. e. *universal*. This Idea is that Being of the Spirit which is eternal and necessary in and for itself."[2]

---

[1] *Encyklopädie*, Werke, VI. 345. (The italics are Hegel's own.)
[2] *Philosophie des Rechts*, Werke, VIII. 313.

The substantial identity of this doctrine with Aristotle's is too clear for controversy. To Aristotle, the pure universal Form inheres in the concrete union of Form with Matter. To Hegel, the pure universal Thought, Conscience, or Person,[1] inheres in the individual man, as concrete union of Thought with Sense ("this individual I,"[2] the same as Kant's more explicit "sense-man endowed with reason;" for Hegel had not the hardihood to deny the fact of sensation, much as it conflicted with his principle that thought is "the universal substance of the spiritual"[3]). The fact, therefore, that Hegel's ethical system, like Kant's, revolves about the individual as such, and that he, like Kant, discovers no universal moral obligation other than that which lies concentrated in the essential common nature realized immanently in each and every individual, is historically explicable by the fact that both build alike on one and the same foundation in the Aristotelian theory of universals. The proof of this is that both arrive essentially at one and the same ethical principle, summing up the supreme rule of Duty in a canon which tersely prescribes *individual perfection*, in the form of a sole and sufficient *personal ideal*: Kant in his "practical imperative," "Act so as to treat humanity, whether in thy own person or in the person of every other, as always an End, never as a Means alone!"[4] and Hegel in his "mandate of ethical law," "Be a person, and respect others as persons!"[5] These noble precepts, be it understood, declare a personal ideal for the individual as such, but no social ideal whatever; they are addressed to the individual alone; and in them culminates the ethics of individualism.

III.

How confused and confusing is the present state of ethical theory, may be best illustrated, perhaps, from the preface to Professor Bowne's *Principles of Ethics*. In this preface the author says:

---

[1] "Person" does not mean to Hegel the whole man, but only "the abstract will, existing for itself." (*Philosophie des Rechts*, Werke, VIII. 74.)

[2] *Phänomenologie des Geistes*, Werke, II. 78.

[3] *Encyklopädie*, Werke, VI. 46.

[4] *Grundlegung zur Metaphysik der Sitten*, Werke, IV. 277.

[5] *Philosophie des Rechts*, Werke, VIII. 75.

"Moral philosophy has been with us from the beginning; but moral theory still fails to get on. According to Rousseau, Socrates defined justice, but men had been just before. It is a happy circumstance, and one very full of comfort, that, in the great bulk of duties that make up life, men of good will can find their way without a moral theory."

The whole ethical question is here most innocently begged. Who is "the man of good will"? Clearly, the man who wills the good, that is, so directs his will as to realize the good. But the directing aim of his will is his ideal, his formed thought of the good, and this formed thought of the good is precisely his "moral theory." Hence "men of good will" *cannot* "find their way without a moral theory." In fact, no man can will at all without a moral theory; no man can will without willing some particular end, and no man is a moral being who is not compelled, by a power from which there is no escape, to judge his own ends as good or bad; and the principle by which he judges them, whether lofty or degraded, is *his* moral theory.

The great trouble with the world, the chief reason why there is so much easily preventable evil in society, is the fact that so many men's moral theories are so miserably bad. Knowledge of good and evil is indeed not virtue; yet there can be no virtue without knowledge of good and evil. Just so far as ignorance works wrong in the world, just so far is the world suffering from lack of a true and universally adopted moral theory.

If, then, "moral theory still fails to get on," and the fact is patent enough, may it not be due to the other fact that moral theory still cleaves so pertinaciously to its half-principle of individualism? For individualism is false in its halfness alone; it is the truth in it which has kept it so long alive. But the ancient Aristotelian theory of universals, out of which individualism in modern ethics and in modern philosophy originally sprang, has already yielded to a larger truth in modern science; and for this reason modern science is a schoolmaster whom modern philosophy and modern ethics do themselves incalculable wrong to ignore. This is not the place for dwelling on the point; that must wait. But it is necessary to state succinctly, though only in part, what is that enlarged theory of univer-

sals which modern science has already substituted for the Aristotelian theory—which, however, it has not yet formulated in distinct terms or even distinctly conceived as a new, universal, and revolutionizing principle.

It is the capital error of Aristotle, Kant, Hegel, and modern idealism in general, that *the universal inheres in the individual*; but it is an error which modern science has already outgrown. Most certainly, there is a common essential nature to be found in all things of a kind, but this common essential nature is not the kind; most certainly, there is a real community of constitution in all specimens of a species, but this real community of constitution is not the species. True, this common essential nature, this real community of constitution, can be separately conceived, dropping out of view all other elements of the real individual being in which alone it has a real existence; but it is then a pure abstraction, and this abstract concept is not the real universal to the real individual. The real universal to the real individual is the totality of all the individuals, not merely as an aggregate, but also as an individual of a higher order.[1]

For instance, there is a certain common lion-nature which is found in every lion, abstracted in the concept, and uttered in the definition; but all lions together constitute the species lion, and the species lion is an individual of a higher order to the genus cat. Hence to the individual lion the real universal is, not the common lion-nature, which does indeed inhere in every lion and is abstracted in the concept, but (1) all lions as an *aggregate universal* of individuals, and (2) all lions as a *single universal* (the one species lion) in the higher universal (the one genus cat). With good reason, therefore, the scientific class-name of "the lion" includes both the species and the genus, as "cat-lion" (*Felis leo*). Thus the theory of philosophical idealism, which identifies the universal with the common essential nature, holds with perfect consistency that the universal inheres in the individual; while the theory of Scientific

[1] Mr. Spencer half expresses this new scientific conception of the universal, when he says: "It is true that the species has no existence save as an aggregate of individuals" (*Justice*, p. 6).

Realism, which identifies the universal with the totality of its individuals as one species, holds with equal self-consistency that the individual inheres in the universal. The ethical outcome of the first theory, as has been shown above, is ethical individualism; the ethical outcome of the second theory, as remains to be shown, is ethical universalism.

But the needed advancement of ethics from individualism to universalism will be deprived of one of the strongest arguments in its favor, unless it is briefly indicated how this same advancement has already been achieved in modern science.

Holding that the universal is the sole object of science, and conceiving it to be simply the essential nature common to all its individuals and immanent in each of them, Aristotle was obliged to reject from scientific consideration all that does not belong to that common nature. This he explicitly declares: "Mere particulars are innumerable, and cannot be known [*τὸ δὲ καθ' ἕκαστον ἄπειρον καὶ οὐκ ἐπιστητόν*]." But, in consequence of thus rejecting all mere particulars as unknowable, there was left to be known merely the uniformities of things, merely their common essential natures abstracted from all their individual peculiarities; and thus the individual differences which distinguish one thing from another of the same kind lost all scientific value. The result of this view was that the common essential nature stood out alone, absolutely identical in all individuals and absolutely unchangeable in the succession of generations. In other words, the Aristotelian theory of universals was the rational and historical root of the doctrine of the *immutability of species*.

It was the transcendent service and imperishable glory of Darwin to succeed in establishing the scientific value, discredited and lost by Aristotle, of the *individual difference*. Conceiving the individual difference as the "spontaneous variation" (which he did not pretend to account for), and perceiving that it is scientifically no less important than the common essential nature, Darwin founded on it his revolutionizing theory of natural selection. For (notwithstanding Weismann and his school) it is the advantageous individual "variation" or "adaptation" which, being transmitted by hered-

ity, multiplied and spread by a long series of generations, and finally incorporated thereby in the common essential nature itself, at last transforms the species and alone accounts for the derivation of one species from another. This vast revolution in biology, establishing the *mutability of species*, has a still profounder meaning in philosophy. The change from Aristotle to Darwin was a change from the Aristotelian conception of the *abstract universal*, as the common essential nature *minus* all the differences of individuals, to the scientific conception of the *concrete universal*, as the common essential nature *plus* all the differences of individuals,—that is, as the real totality of all the real individuals in the species or real universal. Hence the Darwinian revolution in biology, by its necessary implications, is the greatest forward step in philosophy since Aristotle. It finds its philosophical expression in a complete reversal of the leading principle of the Aristotelian, Kantian, and Hegelian philosophies, and declares that the universal does not inhere in the individual, but that, on the contrary, the individual inheres in the universal. And it finds its ethical expression in the substitution of universalism for individualism, as the ground-principle of ethical theory.

What, then, is the meaning of universalism in ethics? To answer this question, nothing is needed but full comprehension of the principle, acknowledged to-day with scarcely a dissenting voice, that "society is an organism." For the organism is the ethical universal itself.

Kant never laid succeeding thinkers under a heavier debt of gratitude than when he analyzed the organism as such.[1] The defects of his analysis are those of the Aristotelian theory of universals, which he inherited; its great and shining merits are due to that incomparable analytical genius which was his own. Premising that "a thing exists as an End in Nature, whenever it is cause and effect of itself," Kant first unfolds this conception of a self-evolving *causa sui* in the concrete example of a tree. He shows that a tree is both cause and effect of itself in reproduction, in growth, and in reparation: (1) one tree is the cause of another tree in natural re-

[1] *Kritik der Urtheilskraft*, Werke, V. 382–390.

production, and simply duplicates its own generic self, when it preserves itself permanently as a genus or kind;[1] (2) a tree is the cause of its own individual being, in a way inexplicable by merely mechanical laws, inasmuch as it is not only perpetually rebuilding its own organic structure according to the original type, but also perpetually elaborating for itself afresh the organic material out of which it thus rebuilds, by communicating to this very material its peculiar specific quality and constitution; (3) even a part of the tree, as a bud or a graft, so reproduces itself as to show that the part and the whole are reciprocally dependent, since, on the one hand, the leaf-eye of one tree, inoculated in the twig of another, becomes the cause of a structural growth according to its original kind alone, while, on the other hand, all the leaves of any tree are themselves products or effects of the whole tree as such; and, further, the same causal reciprocity manifests itself in the self-reparation of organic injuries. Kant next proceeds to distinguish between the two great kinds of causes, the efficient or real and the final or ideal. In the concatenation or series of efficient causes, each term stands as effect of its antecedent and as cause of its consequent, but not otherwise; the series moves forward only, never backward; in a single pair of terms, the first is always cause and the second always effect; there is no reciprocity whatever. But this is not true in the series of final causes. For example, the house is the cause of the rent, yet the

---

[1] Observe how completely Kant is here dominated by Aristotle's notion that the universal inheres in the individual. The tree's kind (*Gattung*) is simply the essential nature common to all trees and found in every tree; hence, in reproduction, the parent-tree literally and merely reproduces *itself* in the offspring-tree, since, in both, this tree-nature is one and the same. Just so, under the same influence, argues Hegel (Werke, VI. 192): "The *Many* are, however, the one what the other is; each is One, or One of the Many; they are, therefore, one and the same." That is, to illustrate, the many horses, as individuals, have only one universal nature, which makes them all alike; each is what the others are; they are all, therefore, essentially, *one and the same specific horse*. Both to Kant and to Hegel, as to Aristotle, the *individual differences* are of no account, no scientific or philosophic value, and are therefore completely thrown away; nothing is retained but this one specific nature, absolutely identical in every specimen. Neither sees that this abstract concept of the *Gattung*, the vaunted *Begriff* itself, is a mere consequence of the infirmity of the limited human imagination. But what a chasm between them and Darwin!

idea of the rent, in the first place, was the cause of the house. Here each term is cause and each is effect of the other; the series moves both forward and backward; there is complete reciprocity. Now the organism exhibits reciprocity in the relation of cause and effect, which thereby becomes the relation of end and means; and Kant defines it accordingly. "An organized product of Nature," he says, "is that in which everything is *end*, and, reciprocally, also *means*." Such, in brief (omitting much), is the result of Kant's analysis of the organism, and he himself applies it to human society, in a footnote, as follows:

"Every member of an organization should certainly, in such a whole, be not simply *means*, but also at the same time *end*, and, since he co-operates in the possibility of the whole, be reciprocally determined by the idea of the whole according to his own place and function."

In only one point is it necessary here to criticise Kant's profound conception of the organism, but this point is vital. He nowhere brings out, even if he had it in mind, the far-reaching distinction between what may be called the indwelling and the outgoing, or the immanent and the exient, in all organic life—and all life is organic. He has much to say about "external teleology" as a relation between things of different kinds, more particularly as "advantageousness of one thing for others." But he overlooks a fact which is vital to ethics: namely, that every organism, and every organ in it, lives *partly for itself* and *partly for another*—is both end and means to itself and at the same time both end and means to another. That to live is, for an organism, to be both end and means to itself, Kant sees; but that to live is also to be both end and means to another, to wit, an including organism, he fails to see, or at least to say. For instance, in the human body, every constituent cell lives a special life of its own, is born, grows, decays, dies, and is excreted; but, while it lives, it lives no less in the larger and longer general, or systemic, life of the whole. Its life for itself, by which it is both end and means to itself, is only possible through its life for the whole, by which it is both end and means to another; and, conversely, its life for the whole is only possible through its life for itself. The unfailing reciprocity of these two special func-

tions in one and the same general function is the absolute condition of any life at all. Thus the finger must live for itself, as its immanent end, and appropriate to itself its own due share of the general nutriment, or it must wither for want of food and become useless to the hand; conversely, the finger must live for the hand, as its exient end, and enter into the hand's functions with its own due share of co-operation, or it must wither for want of exercise and perish as a finger. The case is precisely the same with the hand and the arm, with the arm and the trunk, and, in general, with every organ and the whole organism. So, too, if the whole organism undertook to live solely for itself as one system, and refused to minister duly to its constituent organs, it would die; if all the organs undertook to live solely for themselves in particular and refused to serve each other or the whole, they all would die. But this strict reciprocity between the individual organism and its own organs is not all; it must obtain no less strictly between the individual organism and the organic species, the universal organism to which the individual organism is itself an organ. Cut off all individuals from communion and co-operation with each other in their kind, and it and they must perish together. Every organ and every organism has thus a two-fold end, immanent as life for itself, and exient as life for another; and these two ends, each realizable through the other alone, constitute that total organic end which links organ to organ in the organism, and organism to organism in the species or kind. In this organic constitution of all life, with its characteristic principle of reciprocal finality as both immanent and exient, lies the scientific and philosophic foundation of ethical theory. Out of the simple organism, through ascending grades of animality and increasing consciousness, has been at last evolved the person; but the person bears in himself still the organic constitution, which, ripening in the light of self-consciousness into the ethical constitution, ripens also the principle of organic finality into the principle of personal ethicality. Precisely, however, because organic finality is itself both immanent and exient, personal ethicality becomes intelligible only as egoistic and altruistic in social ethicality; and thus, in ethics, individualism leads

necessarily to universalism, not as denial of individualism, but as absorption of it in wider, deeper, and higher thought.

Thus the natural foundation of ethics is the organic constitution as such, which, unconscious of itself so long as it remains merely vegetative, is developed into the personal-social constitution, as soon as it rises in the course of evolution into the form of ethical self-consciousness. The characteristic principle of the organism as such has now been shown to be that of an all-embracing *reciprocity of ends and means*, by which (1) each part lives immanently for itself, and exiently for the whole, while (2) the whole lives immanently for itself, as all its own parts, and exiently for a higher whole, as the genus of which it is itself a species, the inclusive organism of which it is itself an organ. The vegetative organism knows nothing of its own constitution, which at bottom is the self-manifestation of the All-Conscious in the form of the Unconscious. But the social organism rises gradually into self-conscious knowledge of its own constitution, in proportion as the individual ideals of its many constituent persons gradually coalesce in a universal social ideal. To effect this coalescence is the proper aim of philosophy as ethical theory; and it can be effected solely by making clear to all the organic constitution of the social ideal itself. Let us, then, study the social ideal a little more closely.

The general principle that "society is an organism," in recognition of which the most diverse schools (e. g. Kant and Comte, Hegel and Herbert Spencer) agree, means, in the light of the foregoing analysis, that the individual man is actually an organ to society as an actual organism; and that both maintain their healthy existence solely by actual reciprocity of ends and means. This is the real constitution of the human world, as determined by science and philosophy alike. Hence, because it is the nature of man, when pressed by evil, to dream dreams of a possible good, and to form plans for realizing it in the world, each and every one of us shapes some ideal of his own for the betterment of the general condition. In fact, the times exhibit, as never before, a swarm of conflicting, often self-destructive ideals of this possible "good," and there seems to be no acknowledged standard of reference by which to make plain

their wisdom or unwisdom. Yet Nature sets before us, easily to be read if we will but read it, her own ideal of the "good" in the organic constitution; for health is the unmistakable proof of the attainment of Nature's end, while disease is the equally unmistakable proof of its partial defeat. Why not apply to the ideal world this universal lesson of the real world, and shape our social ideal accordingly? For the ideal world is only the real world as it ought to be, and what it ought to be can be realized solely by developing what it is.

Judged by this principle, the ideal "good for man" is a more complete objective realization of his own organic constitution. Precisely as the person is related to society, so should the personal ideal be related to the social ideal. If the organic constitution is itself Nature's own ideal of the "good," evidenced by health as her reward for obedience to it and by disease as her punishment for disobedience to it, then it follows that person and society stand under the absolute moral obligation of realizing in conduct, personal and associated alike, that reciprocity of ends and means which is the fundamental law of the organic constitution. In this absolute authority of the organic constitution, as the very condition of life itself, and therefore, as the self-revealed and eternal ethical law of Nature herself, lies the ultimate reason, the authoritative and unanswerable "why," of all moral obligation.

Here, then, we have the reply to what Professor Sidgwick propounds as the two great ultimate questions of all ethical speculation: namely, "What is Right?" and "Why should I do it?" Right is actual, not merely intentional, conformity of conduct to the organic constitution. The reason why I should do it is that, by willing it, I will the health of the social organism, while, by willing the opposite, I will the disease, and so far the death, of the social organism. For in vain shall I seek (and herein lies the failure of all individualism in ethics) to separate my own health or my own disease from that of the organic body of which I am merely an organ or member. Disease of the lungs, or stomach, or heart, is itself disease of the body; the health of these is so far health of the body. Tersely but truly put, virtue is the will to live, and vice is the will

to die. When I will to live, by willing to obey the law of the organic constitution, I so far will at once my own life and that of the organism in which alone my own life is possible. When I will to die, by willing to disobey that law, I so far will at once my own death and that of society—am guilty, not only of suicide, but also of murder. In brief, since, on the one hand, all life is organism, and, on the other hand, all organism is reciprocity of ends and means in life, "Right" itself may be shortly defined as "Reciprocity," the one word which, largely understood, declares the whole ethical ideal. Hence no ethical saying ever transcended the lofty meaning of Confucius, if he meant all that his words contain:

"Tsze-kung asked, saying, 'Is there one word which may serve as a rule of practice for all one's life?' The Master said, 'Is not RECIPROCITY such a word? What you do not want done to yourself, do not do to others.'"[1]

It will doubtless be noticed how sternly objective and realistic are these answers to the two great ethical questions. But from this objectivity there is no escape. Ignorance of the law, in Nature as in the civil courts, is no excuse for transgression of it, and counts merely in mitigation of penalty. When I mistake poison for food, I die; my innocence is no reprieve from death. The unintentional wrongs of life make up more than half its misery, and "I did not mean to" brings little relief to a burdened conscience. The organic law of the world, written in every living organism as on tablets of stone, is irrepealable and inexorable; and we are all bound, as rational beings, to master it by understanding and obeying it. There is no other way. What this law exacts, not as your idea or mine, not as human idea at all, but as actual and vital fact, as the very condition of life itself, is all-pervading reciprocity of ends and means in the total constitution of everything that lives. This is organism, and organism is the ethical universal itself.

In the vegetative and animal organism, reciprocity of ends and means appears as *harmony*—simple harmony of organ and function in healthful vital equilibrium, in a self-moving, self-sustaining, and

[1] *Confucian Analects*, XV. 23. The mere difference of form between the positive and negative expressions of the Golden Rule is absolutely immaterial; each, fairly construed, contains the other.

self-evolving whole of purely organic parts, each of which repeats in itself, as a smaller and included whole, the same organic constitution.

But in the moral organism (which is such by no mere metaphor or vague analogy, but rather such by the most literal and most rigidly scientific use of words, as the highest known form of real organization) this reciprocity of ends and means, this living harmony of organ and function in the person and in society, appears as *justice*—simple justice, equity, equality, in healthful ethical equilibrium, in a self-moving, self-sustaining, and self-evolving whole as an organism of persons, each of whom repeats in himself, as a smaller and included whole, a still deeper union of the organic and the personal constitutions. Through self-consciousness or self-knowledge, reciprocity of ends and means is exalted from unconscious harmony to conscious justice, and the constitutive principle of the mere organism is deepened, expanded, and elevated into the constitutive principle of the organism of persons. By this development individualism is swallowed up in universalism—not denied or displaced, but shown to be only one side or element in the divine truth of the real world.

The one absolute and all-inclusive word in ethics is "justice." Grounded in reciprocity of ends and means as organic harmony, its ethical formula is, perhaps, the ancient *cuique suum*—"to each his own," "give every man his due." If my neighbor is in misery, I owe him relief; if he is in happiness, I owe him sympathy; if he is a hero, I owe him admiration; if he is a sneak, I owe him contempt; if he is an oppressor, I owe him indignation and resistance; if he is oppressed, I owe him pity and succor; if he is a victim of vice, I owe him an effort to reform him; if he is good and affectionate, if he loves me, I owe him reciprocating love; and so on to the end. This, and nothing less, is reciprocity or justice between man and man, according to their varying characters, conditions, and capacities. Reciprocity between the individual and society is well formulated in the old saying—"each for all and all for each"; and perhaps I may be pardoned for quoting here an attempt of my own to express a little more fully the essential ideal of social reciprocity, in

the form of a sketch designed long ago to serve as the basis of organization for a free religious association :—

"PREAMBLE : *Whereas*, The grand end of human society is the freest, fullest, and highest development of the individual, and the special end of every minor organization should be in harmony with, and in furtherance of, this general end of society itself ; and

"*Whereas*, The grand end of the individual soul is the realization, in itself and in the world, of the highest Ideal of Humanity, and is thus identical with the great cause of universal human progress :

"*Article I.* Therefore, we hereby associate ourselves into a Free Brotherhood, for the purpose of helping each other and our fellow-men in the endeavor after the perfect Spirit, Life, and Truth.

"*Article II.* The only condition of fellowship shall be sympathy with our purpose, and willingness to co-operate in it." [1]

In this large meaning or conception of the word, *reciprocal justice* is itself the *social ideal*, covering alike reciprocity between man and man and reciprocity between the individual and society. But reciprocal justice is not to be accomplished on the Benthamite principle : "Everybody to count for one, nobody to count for more than one." That maxim is pure individualism—finds universal humanity immanent in every individual, despises and wipes out all individual differences, and treats all men as absolutely alike and of equal worth. Not so universalism. This treats all men as partly alike and partly different, respects the likeness no more than the unlikeness, and seeks to cultivate in every man his individual difference in perfect conformity to his universal nature, whereby his personal ideal itself is subordinated to the universal social ideal of reciprocal justice as his "higher law." The moral "worth" of a man is proportioned to the degree of his free self-subordination to the social organism as his true universal.

Here emerges to view the profound objectivity or realism of universalism in ethics. "Right" becomes something infinitely more than the individual's mere purity of intention, mere rightness of purpose, mere "virtue" or "perfection," which is held up by in-

[1] *The Radical*. A Monthly Magazine devoted to Religion. Edited by Sidney H. Morse. Boston : Adams & Co., 25 Broomfield St.—article on "Organization," in the number for December, 1866.

dividualism and idealism as the complete ethical ideal. If Kant, as we saw, found nothing in the world or outside of it which could possibly be conceived as unqualifiedly good except the "good will,"—and if Hegel was unable to advance an inch beyond this "Autonomy" of the individual will as such,—not so universalism. Universalism finds nothing unqualifiedly good in the world except *the good will so realized as to work objective justice in the social organism.* The "good will" is merely subjective justice: *the good deed must be both subjective and objective justice.* Subjective justice alone is merely the incomplete right, the half-right, the inner right which may yet be the outer wrong. But objective justice is that inner right which knows enough to make itself the outer right, too. The scientific criterion, and the only truly ethical criterion, of the "right" in human conduct, whether personal or associated, is twofold:

1. The conduct itself must, first of all, actually conform to the organic constitution, that is, must be objectively just; and

2. It must be meant to conform to the organic constitution, that is, must be subjectively just.

The social ideal demands objective justice; the personal ideal demands subjective justice; and no conduct is "right," in the full and high sense of the word, which does not meet both demands in full, by subordinating the personal ideal to the social ideal as its "higher law."

The common notion that the agent is necessarily blameless, if he does but intend to act rightly, is mischievously immoral—Kant and Hegel to the contrary notwithstanding. It is nothing but a piece of pernicious sentimentalism, for it excuses the agent from that painstaking, conscientious, exhaustive, *intellectual investigation of facts*, subsisting objectively to himself in the organic constitution of the human world, which, simply because he is a rational as well as a moral being, he is *bound to learn, to know, and to obey.* Such knowledge is no less his "duty" than is his simple innocence of intention. If, in consequence of this principle, it turns out that "men of good will" *cannot* "find their way without a moral theory," and that the "man of good will" is first of all bound to furnish himself with a good moral theory, that is simply to say that the foundation

of all good conduct is knowledge—that thought must lead, feeling and will must follow: in a word, that Infinite Wisdom has so built up this world on the organic constitution, and on objective justice as its ground-principle, that the fool is constitutionally incapacitated for being a saint.

But, on the other hand, if the personal ideal must find in the social ideal its "higher law" as objective justice, no less must the social ideal find in the personal ideal its own "higher law" as subjective justice. The same reciprocity of ends and means which obtains between society and the person obtains no less between their respective ideals; otherwise, the ideal itself would not be the "ought to be" of that which "is." The ethical meaning of this principle is that, when men act together as one organic body, they are bound, in their associated conduct, not only to do justice, but also to intend justice. In other words, their collective conduct should be governed, just as much as their individual conduct, by the very highest and purest ethical intention. They are morally bound to be as intelligent, scrupulous, patient, highminded, honorable, and just, when they act together, as when they act alone. They are bound to study out the real relations between society and the individual, in order that society may do him no wrong, but objective good only, in all its own collective activity. The only just end of collective or social activity is the highest objective good of the individual; but this just end can never be fulfilled objectively unless it is first willed subjectively. The loftiest standard of integrity, honor, benevolence, justice, and wisdom, should enter into the collective act of the whole,—it should dominate and inspire the act of society,—just as much as it should enter into and inspire the act of the individual; otherwise, the end of objective justice cannot possibly be realized. In all social action or conduct, if objective justice is the end, subjective justice must be the means; the end will not be attained unless it is willed to be attained. Hence every person who acts organically with his fellows is as false to them as he is to himself, unless he puts into this associated act the highest principle of his own personal act. If he does this, if all do it, too, then the act of society, on the basis of previous thorough knowledge of what the or-

ganic constitution actually requires in the case at hand, will be both subjectively and objectively just,—in one word, *right*. In this way, the social ideal of objective justice *to all* subordinates itself to the personal ideal of subjective justice *in each*, as its own "higher law," in the sense that any end must depend upon its only possible means for objective realization.

In this way, likewise, we see clearly why the traditional separation of ethics and politics is a great, grave, and most injurious mistake. Ethics knows no such separation, but claims control of the whole field of politics by right of eminent domain. Political action, just as much as personal action, is conduct; and ethics is the science of conduct, whether personal or political, individual or national. Hence international law will find a solid ground in reason for its now unsanctioned principles, when it comes to see that the organic constitution, the principle of objective justice, is the fundamental ethical law of the universe—that very "law of Nature" which it has thus far sought for in vain, but which governs the ethical relations of nations no less than it governs those of individuals. Masses of men are still men, and carry men's personal natures and personal ideals into all their collective actions. When, discarding the terribly false maxim that "corporations have no souls," and learning that corporations have exactly as many souls and exactly as much soul as have the men that make them, each man elevates his corporate action to the loftiest standard of personal honor, and learns to submit his conduct in politics and in business, no less than in private life, to the eternal law of *objective and subjective justice*, one and indivisible in the constitution of the social organism, then indeed will the world become something better than the den of wild beasts which it now too often seems. For then, whether acting in greater or in smaller masses, whether organized as nations or as minor corporations, many men will have learned to act as one man, and that one man to act by the personal ideal—which is subordination of the social ideal to the personal ideal as its "higher law."

To recapitulate: the social ideal is the organic constitution of the whole as a whole, conceived as free self-development of society as it is into society as it ought to be; and its organic principle of

development is objective justice through subjective justice. The personal ideal is the organic constitution of the part as a part, conceived as free self-development of the person as he is into the person as he ought to be: namely, an organ (1) living immanently for himself, (2) living exiently for his inclusive organism, and (3) living these two lives as one, each through the other alone; and its organic principle of development is subjective justice through objective justice. "Duty," or the "Ought," or "Moral Obligation," is the indefeasible claim of the organic constitution in society and in the universe itself (1) to determine the *ideal aim* in the person, and (2) to determine thereby the *real conduct* of the person. "Objective good" is the organic constitution as such, and "subjective good," or health, is conformity to it; the "bad" is disease or disorganization, degeneration of the organic into the merely mechanical, relapse of the living reciprocity of ends and means into the lifeless sequence of mere cause and effect. "Virtue" is the will to live, to be an organism; "vice" is the will to die, to be a corpse or mere machine. "Right" is reciprocity of ends and means, developed by self-consciousness from the simple "harmony" of the organism as such into the objective and subjective "justice" of the person as such. "Perfection," "righteousness," or "virtue," as the essential will to live by realizing the ideal of all life, is the substance of which "happiness" is the shadow—its fitting, natural, and normal accompaniment. But, just as the tropical traveller, when the sun is in the zenith, will find himself accompanied by no shadow save that which is directly under him, so, also, in some torrid tract of self-sacrifice to which duty may conduct him, life's traveller may find himself bereft of all happiness save that which he resolutely tramples beneath his feet. Such was that nameless captain on some Western lake, who, when his vessel caught fire, steered it to the shore against the wind and rescued his passengers from death, while he himself, fanned fiercely by the back-sweeping flames, perished in torture at his post. Heroism of such sublimity as this exhibits a loyalty to the social ideal which paralyzes the tongue of praise, and admits of no explanation by any immanent or self-returning end. The ultimate aim of a martyrdom so pure was necessarily disinterested or

exient—directed not to himself, not to his own "happiness," not even to his own "goodness," but simply and solely to the good of those for whom he bore the agony and died. And this is the apotheosis of the human will—its pure self-identification with the Divine Will, its pure self-dedication to God.

Thus universalism in ethics culminates in the principle of Exiency—of the exient end and the immanent end as reciprocally necessary to each other, in order to constitute that total organic end by which alone the individual finds his place in Nature, realizes his ideal in Society, and achieves his destiny in God. By this principle of exiency as its innermost ethical content, the organic constitution appears as universal reciprocity of ends and means in Biology, universal co-operation in Sociology, universal objective and subjective justice through universal reciprocal service in Ethics, and universal self-consecration to the Divine in Religion. Substitution, therefore, of universalism for individualism, as the ground-principle both of ethical theory and of ethical practice, constitutes that "advancement of ethics" which is the deepest spiritual need of the modern world.

Francis Ellingwood Abbot.

Cambridge, Mass. October 31, 1892.

OUGHT THE UNITED STATES SENATE TO BE REFORMED?

NEARLY a year ago I read in *The Open Court* (December 28, 1893) a small note that raised large hopes. I understood it as a promise from Professor von Holst that he would soon deal "at full length" with the criticisms of General Trumbull on the United States Senate. At last, I thought, we shall have a competent treatment of the gravest constitutional problem from a cosmopolitan publicist, one not liable to our hereditary political provincialism, which can only answer, "Great is Constitutio of the Americans!" Anticipating fulfilment of this hope, I eagerly perused the Professor's contribution in *The Monist* (October, 1894). One would not usually look for criticisms of organic law in a Fourth-of-July oration: on that day the eagle is not apt to be punctured by a pen from its own spread wing; yet here, too, the Professor promises "later on" a "serious examination" of the question raised by myself and others concerning the Senate. The "later on" seemed to refer to a further part of the oration, but I must have misunderstood it. The Professor devotes himself to the bicameral system; but the question is not whether the bicameral system is good, but whether a particular form of it, unknown to any State or nation except our federal Union, is defensible. No one knows better than von Holst that the great statesmen of the Constitutional Convention of 1787 regarded the unequal representation established in the Senate as an outrage on the bicameral system, and that the men who chiefly forced it on them with menaces admitted its unfairness in principle. Does the Professor regard the protests of Franklin,

Hamilton, Wilson, Mason, Randolph, Morris, Madison, as wrong or right? I search his oration in vain for an answer. At one point he starts out bravely, as if about to meet the question, but the outcome resembles Emerson's description of a far-western road, which, beginning as a fine avenue, changed to a squirrel-track, and ran up a tree. The Professor's tree is Bicameralism; his oratorical avenues all lead to it; but I do not propose to follow him thither, although he has tried to draw me on that trail. Criticising my contention in *The Open Court* (March 15, 1894), that "the entire abolition of the Senate does not come within the range of practical politics," he says: "Irrespective of what the chances of success during his life-time might be, he owes to himself, as a good patriot, to exert himself to the utmost to have this vicious receptacle of 'American snobbery' razed to the ground." But I have a preference for evolutionary methods of reform, and have a right, since he makes me a clothes-horse for his rhetoric, to remind him that, the Fourth of July being over, we await his "serious examination of the question, whether he, and those who more or less agree with him, are right in asserting that the Senate is a pernicious incubus fastened upon the republic by the short-sightedness, the narrow prejudices, and the self-seeking provincialism of the authors of the Constitution." These are the Professor's words, not mine; I should substitute for the last five words, "some members of the Convention"; but I will not stop to quarrel about the phraseology, if the Professor will bear in mind that it is no answer to an argument to travesty its conclusions, and will frankly meet the issue.

It is with a genuine expectation that he will do so that I propose to restate the matter more fully, both historically and in connexion with recent events. But before doing so I am compelled to make a few reclamations. In my paper on Senatorial Reform I said:

"The Constitution of 1787 was really a treaty between thirteen sovereigns, the smaller empires refusing to unite unless their inherited supremacies were secured the power to overrule the voice of the nation. This was the real foundation of the Senate. But in the discussions of the Convention (1787) that doctrine of sovereignty, *discredited even in England*, was veiled, though the veil was as discreditable

as the motive concealed. The necessity being first of all to get the second Legislature established in the Constitution, it was done with an innocent air, and without discussion, on the mere statement that England had two Houses, and that two Houses had always proved favorable to liberty."

This the Professor quotes (omitting, curiously, the four words italicised) and on the score of that "veil" accuses me of "historical color-blindness." "There was nothing whatever 'veiled' about this question in the Convention," he says, and goes on into a page of quotations concerning the division of the Legislature into two branches. But I do not say the scheme of two branches was veiled. It was the discredited doctrine of State sovereignty, and the intention to force it into the second chamber, which were veiled. Where is the color-blindness? It is in the Professor seeing a plain veil as a red rag, rushing at it, but in another part of his oration confirming my history. He says: "To make the Senate besides a representation of Statehood was altogether an afterthought," and "so far as we can learn from the exact sources, the thought of making the Senate a representation of the States as such was at first not entertained by a single member." I am surprised that Professor von Holst can suppose that the members from the small States could have threatened to break up the Union upon an afterthought, a point on which they had brought no instructions. However, my statement is not merely inferential; there are "exact sources" of information, among them the following Note by Madison on the New Jersey plan, introduced in the Convention June 15, 1787, which proposed only one House, and that constituted like the present Senate, except that this body, elected by the State Legislatures, was also to elect the Federal Executive! Madison says:

"This plan had been concerted among the Deputations, or members thereof, from Connecticut, New York [then opposing Hamilton's efforts for a National Government], New Jersey, Delaware, and perhaps Mr. Martin from Maryland, who made with them a common cause, though on different principles. . . . The States of New Jersey and Delaware were opposed to a National Government, because its patrons considered a proportional representation of the States as the basis of it. The eagerness displayed by the members opposed to a National Government began now to produce serious anxiety for the result of the Convention. Mr. Dickinson [Delaware] said to Mr. Madison: 'You see the consequence of pushing things too far.

Some of the members from the small States wish for two branches of the General Legislature, and are friends to a good National Government; but we would sooner submit to a foreign power, than submit to be deprived, in both branches of the Legislature, of an equality of suffrage, and thereby be thrown under the dominion of the larger States.'" (*Madison Papers*, ed. 1840, Vol. II, p. 862.)

John Dickinson, who had refused to sign the Declaration of Independence, partook of the smallness of the State he represented (Delaware), but was a more large-minded man when he became a Pennsylvanian. He and his fellow small State men had, before that secret communication to Madison, been making speeches in the Convention for some weeks, and their worst intimation had been that, if they were not allowed State-equality, Delaware, and perhaps Connecticut, might withdraw their members from the Convention. These petty "sovereigns" began their terrorism only after the Convention, despite such intimations, had received (June 13) its Committee's Report, assigning proportional representation to both branches. They then asked a day for consultation, and on bringing in their rival scheme (June 15) secretly revealed to Madison their "doctrine of sovereignty," which was to rule or ruin. They had resolved to perpetuate the Confederation, and to strengthen its inequitable feature, and they began by overruling the voice of the Convention. But that menace of a foreign alliance, whispered to Madison on June 15 was still veiled from the Convention for two weeks. It was not until June 30 that the threat was made in the Convention. Hitherto their position had been that their State rights and independence would be at the mercy of the large States. This Dr. Franklin met with a compromise (June 30) "that in all cases or questions wherein the sovereignty of individual States may be affected, or whereby their authority over their own citizens may be diminished, or the authority of the General Government within the several States augmented, each State shall have equal suffrage." Franklin's proposal tore off the veil. It was now revealed that these small States were not acting in self-defence, but resolved, as I said in my *Open Court* article, quoted by von Holst, to secure to their inherited supremacies "the power to overrule the voice of the nation." They scornfully rejected Franklin's compromise, and the

plan stood nakedly what Hamilton declared it, "*a contest for power, not for liberty.*" "There is no middle way between a perfect consolidation, and a mere confederation of States," said Bedford of Delaware, who closed his unpatriotic speech as follows:

"*He was under no apprehensions. The large States dare not dissolve the Confederation. If they do, the small ones will find some foreign ally, of more honor and good faith, who will take them by the hand, and do them justice.*" (*Madison Papers*, Vol. II, p. 1014.)

Under cover of that pistol the Convention surrendered. I submit that these facts amply support my challenged statement about the veil. And I am reminded by Bedford's speech of another point questioned by Professor von Holst. I stated further, that "when the subject of disproportionate representation in the Senate came before the Convention, it was supported as a principle only on the ground that in the British Parliament small places, with little population, were represented equally with the largest constituencies." Von Holst inserts after my word "only" a note of admiration "(!)." In the speech of Bedford, quoted above, he said: "Look at Great Britain. Is the representation there less unequal? But we shall be told again, that is the rotten part of the Constitution. Have not the boroughs, however, held fast their constitutional rights? And are we to act with greater purity than the rest of mankind?" On June 20 Lansing of New York said, "A great inequality existed in the counties of England. Yet the like complaint of peculiar corruption in the small ones had not been made." Several of the advocates of disproportional representation had (as will be shown hereafter) admitted its unfairness *as a principle*, and if Professor von Holst can find other defences of it, *as such*, in the Debates, except this citation of the now extinct rotten borough system, I shall admit my error. Perhaps I should have added an idiotic remark of Patterson of New Jersey, who compared the large and the small State to the rich and the poor man, who ought to vote equally; the real parallel of his proposal being to make, by legal compulsion, the poor man's penny equal in purchasing power to the rich man's dollar. But von Holst can hardly regard that as an argument.

On another point Professor von Holst bases a charge of histor-

ical inexactness on what is really a misquotation of my paper by himself. To my sentence in the preceding paragraph, challenged by his note of admiration, he appends, with but three intervening dots, the following mutilated quotation from my paper: "Furthermore, besides being 'in the European fashion'. . . it [the Senate] has been as a fashion repeated in all the States." Thereupon he easily accuses me of "the erroneous assumption that the States have " as a fashion repeated" the federal Senate. That (he continues) "is hitching the cart before the horse. It is repeatedly and explicitly stated in the debates of the Convention that it repeated the 'fashion' set by all the States with the exception of Pennsylvania." Now the three dots alluded to "veil" forty lines of my article. Their omission conveys the impression that I was continuing the historical statement, whereas I had left it, and was referring to the fashion prevailing not in the original thirteen, but in our present forty-four States. In the passage which the Professor drags back to the Convention, I am giving reasons why the Senate is not likely to be abolished, but may be reformed:

> "The Senate has gradually taken root in American snobbery, it offers a number of lordly offices for eminent office-seekers, and it represents provincial pride. Furthermore, besides being 'in the European fashion' (superficially, for in no other country is there a second chamber so constituted) it has been as a fashion repeated in all the States. Had the substance as well as the form of the national Senate been reproduced in the several States the whole system must have long ago broken down, like the 'rotten borough' anomaly in England."

I acquit Professor von Holst of intentional unfairness, and suspect that he looked through my article less to weigh its words and arguments than to pick materials for a unicameral man-of-straw to be demolished amid fourth of July plaudits. I do not underrate the Professor's eloquence, but value higher his ability as an investigator of political history. As in our American Revolution the guiding intellects were those of Paine from England and Hamilton from the West Indies, and as the clearest study of our Democracy came from the French De Tocqueville, it is in the line of our traditions that we should receive new light from thinkers trained in countries older in culture and experience. John Stuart Mill once expressed to me his

surprise that there had not arisen in the United States any school of constitutional study and self-criticism. Where can such a school be more appropriately founded than in Chicago, the great western metropolis, where the Proportional Representation League was formed during the World's Fair; and who is more fitted to forward this new departure than von Holst? I cannot feel that he is rightly represented in the implications of the oration before me. That he does not agree with General Trumbull's way of putting it, or with mine, is of little importance compared with the fact that he does not adopt the arguments in favor of disproportionate representation. In the one allusion which seems to favor such uniquely inequitable representation he throws away the argument he had seemed to accept: he cites Pomeroy as affirming that we have in the Senate anchored the principle of local self-government, but presently says this principle would survive the abolition of the Senate. "This principle," says von Holst, "is the vital force not only of Anglican but of Germanic liberty." Exactly. Scotland does not possess less local self-government because it cannot neutralise the vote of England, nor Hesse-Cassel because it cannot balance the voice of Prussia, in those imperial Parliaments. Had von Holst found any argument sustaining the senatorial anomaly would he not have stated it? He recognises the deterioration of the Senate, and is not disinclined to a constitutional amendment that would make it popularly elective. Does he really mean to exclude an amendment which would render it representative of the American people? Edmund Randolph noticed that after the Constitution was ratified there was observable an extreme solicitude to cherish its defects. Whether this was the mother's proverbial favoritism for her deformed child, in the case of the Senate, or the swollen pride of "Prerogative" (Hamilton's label for the power of the small States), that solicitude continues. It survives the tragedies it has cost; it outlives demonstrations of the Senate's worthlessness as a court of impeachment, and repeated proofs that in so small a body the balance of power is easily purchasable; and to-day we find eminent men crying, Reform if you will, and as you please, but leave us—O leave us—the power of Delaware to neutralise the power of New York! I refuse to believe

that this is the voice of von Holst until he says so plainly, and, regarding him as a judicial man, when not engaged with patriotic orations, I submit to him our fair claim that he should deal with the question at issue (which is not Bicameralism but Disproportionate Representation) apart from the shortcomings of this or that writer on the subject. I submit, too, that however necessary it may be on July 4 to describe the Constitution as a "master-work," notwithstanding the many patches which have mended that pre-scientific document, such euphemistic commonplaces are not what we have the right to expect from a public teacher like von Holst. And I further submit the following facts and contentions.

"We may indeed with propriety be said to have reached almost the last stage of national humiliation," are words of Hamilton, cited by von Holst, which represented the feeling of the greatest men in America, and led them to gather in the Convention of 1787. But in that Convention they were confronted by local and sectional interests, of which two were essentially unrepublican, and at the same time strong enough to compel the Convention to establish them in the Constitution. These two were Slavery and State-sovereignty. They were twin barbarisms, and demonstrated to be such by the chief statesmen of the Convention, whom they conquered by selfish and unpatriotic recklessness of consequences, and by their treacherous combination. The blush of the Convention on admitting the barbarisms is visible in its omission of their names. Neither "Slavery" nor "Sovereignty" was considered a word worthy to enter the American Constitution. But by their joint work the blush of the Fathers ultimately became the shed blood of their children. It has required a century of discords and tragedies to repair even in part the disgraceful compromise of our overpraised ancestors with Slavery, whose miserable *sequelæ* survive under the protection of its twin or *pal*—a superstition of State-sovereignty which prevents the national conscience from restraining the savagery of race-hatred, or securing the constitutional rights of its citizens, if a State chooses to deny them; insomuch that it is easier for the Nation to protect an American in Europe than in one of its own States!

The framers of the Constitution did not foresee the gigantic

power that Slavery was to attain; they supposed that it would gradually die out of the South as it was dying out of the North, and that the term assigned to the Slave Trade, 1808, would destroy its root. At any rate, we will give them the credit of so believing. But they made no such mistake in the unrepublican principle which they established in the Senate. No writer can now add anything to their arguments and pleadings against it, except to point to the miserable fruits which have fulfilled the prophecies and justified the indignant protests of the ablest men among them.

"Gouverneur Morris declared proportionate representation 'so fundamental an article in a national government that it could not be dispensed with.' Madison affirmed 'the necessity of providing more effectually for the security of private rights. Interferences with these were evils which had, more perhaps than anything else, produced this Convention. Was it to be supposed that republican liberty could long exist under the abuses of it practised in some of the States?' He declared equality of States in voting 'inadmissible, being evidently unjust.' Brearly, even in a speech advocating such equality, said, 'Is it fair, then, it will be asked, that Georgia should have an equal vote with Virginia? He would not say it was.' Hamilton was 'fully convinced that no amendment of the Confederation, leaving the States in possession of their Sovereignty, could possibly answer the purpose.' 'The members of Congress, being chosen by the States and subject to recall, represent all the local prejudices.' 'As States are a collection of individual men, which ought we to respect most, the rights of the people composing them, or of the artificial beings resulting from the composition? Nothing could be more preposterous or absurd than to sacrifice the former to the latter. It has been said that if the smaller States renounce their *equality*, they renounce at the same time their *liberty*. The truth is, it is a contest for power, not for liberty. Will the men composing the small States be less free than those composing the larger?' 'The State of Delaware, having forty thousand souls, will lose *power* if she has one-tenth only of the votes allowed to Pennsylvania, having four hundred thousand; but will the people of Delaware *be less free*, if each citizen has an equal vote with each citizen of Pennsylvania?' (It was Hamilton who moved 'that the rights of suffrage in the National Legislature ought to be proportioned to the number of free inhabitants,' and 'that the right of suffrage in the second branch ought to be according to the same rule as in the first branch.' Edmund Randolph said, 'The true question is, whether we shall adhere to the federal plan, or introduce the national plan, The insufficiency of the former has been fully displayed by the trial already made.' 'We must resort to a *national legislation over individuals* [italics in Madison's report], for which Congress are unfit.' Dr. Franklin reminded the Convention that the 'method of voting by States was submitted to originally by Congress under a conviction of its

impropriety, inequality, and injustice, and that it was done because in the words of their resolution (September 6, 1774) they were not "at present able to procure materials for ascertaining the importance of each colony."' Mr. Pierce considered the equality of votes under the Confederation as the great source of the public difficulties. 'The members of Congress were advocates for local advantages.' George Mason asked, 'Is it to be thought that the people of America, so watchful over their interests, so jealous of their liberties, will give up their all, will surrender both the sword and the purse to the same body,—and that, too, not chosen immediately by themselves. They never will. They never ought.' Mr. Williamson 'begged that the expected addition of new States from the westward might be taken into view. They would be small States; they would be poor States; they would be unable to pay in proportion to their numbers, their distance from market rendering the produce of their labor less valuable; they would consequently be tempted to combine, for the purpose of laying burdens on commerce and consumption, which would fall with greater weight on the old States.' James Wilson (afterwards Justice of the Supreme Court) said, 'The leading argument of those who contend for equality of votes among the States is, that the States, as such, being equal, and being represented, not as districts of individuals, but in their political and corporate capacities, are entitled to an equality of suffrage. According to this mode of reasoning, the representation of the boroughs in England, which has been allowed on all hands to be the rotten part of the Constitution, is perfectly right and proper. They are, like the States, represented in their corporate capacity; like the States, therefore, they are entitled to equal voices—Old Sarum to as many as London. (The 'rotten borough system' prevailed in Connecticut and one or two other States.) 'The gentleman from Connecticut (Mr. Ellsworth) had pronounced, that if the motion should not be acceded to, of all the States north of Pennsylvania one only would agree to any General Government. . . . If the minority of the people of America refuse to coalesce with the majority on just and proper principles, if a separation must take place, it could never happen on better grounds. The votes of yesterday against the just principle of representation, were as twenty-two to ninety, of the people of America. . . . The question will be, shall less than one-fourth of the United States withdraw themselves from the Union, or shall more than three-fourths renounce the inherent, indisputable, and unalienable rights of men, in favor of the artificial system of States? . . . Such an equality will enable the minority to control, in all cases whatsoever, the sentiment and interests of the majority."

I suppress no arguments on the other side. Towards the close of the debate Wilson declared, "The justice of the general principle of proportional representation has not, in argument at least, been contradicted." Madison repeatedly reminded the leaders of the small States of the same thing. "It was admitted by both the gen-

tlemen from New Jersey," he said, "that it would not be just to allow Virginia, which was sixteen times as large as Delaware, an equal vote only;" and at another time he "entreated the gentlemen representing the small States to renounce a principle which was confessedly unjust; which could never be admitted; and which, if admitted, must infuse mortality into a Constitution which we wished to last forever." The admissions and the confessions were not denied. "Their language was," says Madison, "that it would not be safe for Delaware to allow Virginia sixteen times as many votes." That is, they were not considering the rights of man at all, not the people, but animated by a petty pride of imperial sovereignty which George the Third himself would have abhorred. Let Hamilton's declaration be borne in mind, that these small States were not contending for their own independence, or for the local self-government which Pomeroy and von Holst say is "anchored" in the Senate. Protection for these, more ample than they needed, was offered them in the proposal of Franklin that in all questions affecting State rights or local interests the States should have equal votes. In rejecting that concession they demanded the right of Delaware to balance Pennsylvania *in Pennsylvania's own concerns*. The small States had the giant's power, in their ability to rule or ruin, to refuse union and form alliance with England, which still held the six military posts in this country, and awaited eagerly an opportunity to recover her lost colonies. They thus had the power of a giant, and they used it like a giant. The impressive speech of Wilson (June 30) was replied to by the unpatriotic menace of Bedford, that they would find a foreign ally. Bedford was rebuked by Rufus King and Edmund Randolph, but his arrow had reached its mark, and on July 5 the Convention, fresh from celebration of a festival of human equality, received from its Committee a report in favor of repudiating that equality. Again and again had the just principle been affirmed by the Convention, with majorities representing three-fourths of the people of America, but now began the disgraceful surrender of these to the one-fourth.

And it was the fourth which had shown itself least patriotic. Under the Confederation Rhode Island had not only refused the re-

quisitions of Congress, but it refused to send any representative to the Constitutional Convention in which the other small States were securing for it equal legislative power with New York. New Hampshire was not represented in the Convention until a month and nine days after the day appointed for its session. New Jersey by express act had violated the Federal Articles, by refusing compliance with the requisitions of Congress. Connecticut, ruled by rotten boroughs, had to be bribed with public land to acquiesce in a decree constitutionally awarded against her claim on territory of Pennsylvania; it had also sent to Congress its refusal to comply with its constitutional requisitions. Maryland, whose representative, Luther Martin, spoke (June 27, 28) more than three hours in favor of State sovereignty and equality, had navigation laws which treated citizens of the other States as aliens. Such was the provincial selfishness which coerced, by threats of disunion and foreign alliance, three fourths of the people of America. Even when members enough had surrendered to enable the proposal to pass (July 7) the opponents represented two thirds of the American people. "This fundamental point," said Wilson, "has been carried by one third against two thirds."

It is not necessary to give space to the further struggle for the forlorn hope. It is important to observe that in this case none of the advantages that may be claimed for the power of a minority applied. The minority that founded the Senate were not either in means, culture, or patriotism, equal to the statesmen they subdued. All their brains together would not have made a Franklin or a Hamilton. And the Chamber they founded was provided with no means whatever for securing in it men who would revise with more learning the measures of the representatives, or check their precipitancy. Whether the Senate has served any such purpose is a matter to be dealt with presently; I only make here the historical point that in its origin the Senate represented not only the control of three-fourths of the people by one-fourth, but of the greatest statesmen by their inferiors in every sense. Professor von Holst is quite right in saying that the English House of Lords renders eminent service in compelling Commons and people to give fair chance to "the sober second thought," but the above facts discount his added remark: "Read

the debates of the federal convention and of the ratification conventions and *The Federalist*, and you will soon find out whether this was not one of the most essential functions, nay, pre-eminently *the* function assigned by the fathers of the Constitution to the Senate." So far as debates in the federal Convention are concerned, it is true enough that their proposal of a *second chamber* was to secure the sober second thought, but I would like to know where the Professor finds in those debates any expectation that the *Senate*—that is, after disproportional representation was imported into it—would fulfil such function. And it is from these debates of the Convention, where thoughts were expressed in the freedom of secrecy, that the only clear light can be obtained on the subject. In the State ratification conventions the merits of such questions were subordinated to a choice of evils. The anonymous papers called *The Federalist* represent advocates making out the best case they can for an instrument whose alternative seemed to them national dissolution. In the same spirit all but three of the great men signed a Constitution whose injustice in a fundamental point, and faults in others, they had demonstrated. "The moment this plan goes forth," said Gouverneur Morris, "all other considerations will be laid aside, and the great question will be, shall there be a National Government or not; and this must take place, or general anarchy will be the alternative." Governor Randolph pronounced some features of the Constitution "odious," but he carried Virginia for it. Hamilton said: "No man's ideas were more remote from the plan than his own were known to be; but is it possible to deliberate between anarchy and convulsion on one side, and the chance of good to be expected from the plan on the other?" It was at least a *chance*, and its rejection seemed certain ruin. *The Federalist*, however useful, is a very misleading work if it is not remembered that it was written by Hamilton, Madison, and others, in order to palliate or conceal the faults of the Constitution, in order to secure its ratification, as the only alternative of anarchy. In my opinion, they committed a grievous mistake in all of their concessions. Had the large States, representing three-fourths of the nation, united, as Wilson advised, to form a republic (which this country has never been), the petty sovereignties would

have all come in, like Bo-Peep's sheep, bringing their tails behind them. But it is of no use now to consider what might have been. It is important that the people, in presence of recent senatorial oppressions, should study the history of that anomalous institution, and understand that instead of its being, as Fourth-of-July orations would persuade us, an expression of the wisdom of our patriotic fathers, its vices were recognised by them, its evil fruits foreseen, and it was accepted only as the alternative of the ruin threatened by an unpatriotic and very small minority.

In *The Forum* for November, 1893, an article appeared from the pen of Professor von Holst in which he indignantly arraigned the behavior of the Senate in a recent case, and says: "A clear majority is for the unconditional repeal of the Sherman law, and therefore the correct preamble of any compromise measure should read thus—'Whereas the majority has allowed itself to be bullied by the minority, be it enacted'—." But why should a minority in the Senate not defeat the majority by bullying or any other means? That is the original senatorial rôle. The above history proves that the Senate was born of a bullying minority. Obstruction? Had it not been for obstruction placed by some half dozen men in the Convention in the way of forming any government at all, the Senate, as now constituted, could not have existed. The Convention of 1787 was itself a Senate; and if Professor von Holst is indignant at present senatorial bargains, as between the tariff hucksters and silverites, what has he to say of the bargain that gave slave-owners their fugitive-slave clause and additional representation for their non-voting slaves? Were they specimens of our Founders' wisdom and virtue? In his article in *The Forum* Professor von Holst searches in vain for any authority that can check the power of obstruction in any minority, however small, of the Senate, and his desperate resort to the influence of the press and public opinion is, to my mind, a confession that the evil is organic, without other than organic remedy. He says it is unconstitutional, but of what value is an inferential power for whose application there is no apparatus? Let him ponder the words of the great Justice Wilson in the Convention: "If equality in the second branch were an error that time would correct, I would

be less anxious to exclude it, being sensible that perfection is unattainable in any plan; but being a fundamental error, it ought by all means to be avoided. A vice in the representation, like an error in the first concoction, must be followed by disease, convulsions, and finally death itself."

The recent struggle on the tariff, in which a handful of purchased Senators were able to defeat the suffrage of the nation, the House of Representatives, the Executive, and the majority of their own chamber—the whole nation—reproduces a picture of the scene when the Senate was founded. It has also revealed the fact that there must be a death, as Wilson predicted. Whether it will be that of the nation or of its chief unrepublican feature, remains to be seen. Professor von Holst says that the abolition of the Senate, as now constituted, would necessitate a number of other far-reaching changes in the Constitution: unquestionably; but there is no fear that they will come too fast. Our country is styled a republic, but it is only by courtesy. There has never been a day when this nation was a republic. Towards the close of the Convention Randolph said: "We have, in some revolutions of this plan, made a bold stroke for Monarchy. We are now doing the same for an Aristocracy." Randolph was one of the few lawyers in the Convention who really understood the English Constitution. It is still the case that principles extinct in England live again in its colonies, and in the last century lawyers in America still got their notions of the English Constitution from old law-books. They did not perceive that the House of Lords had already parted with its absolute veto on the Commons, and indeed that superstition about the English Constitution survives. In the American Constitution monarchy was restored with new vigor in the guise of Presidency, and imperial State irresponsibility was established under the impression that it was British "sovereignty," though no such supremacy had existed in Great Britain since *Magna Charta*. The rule of the many by the few was here admitted without those restrictions which had been imposed on Crown and Peer in England by centuries of revolution and evolution. The English people are naturally aghast that we should submit to the imposition of taxes by a chamber in which our people

are not represented. The new tariff itself is of small moment compared with the political conditions illustrated in its enactment. These are of such significance, in connexion with the question of senatorial reform, that I call further attention to them.

A particularly notable number of *The Federalist* is 62. It was no doubt written by Hamilton (though by some ascribed to Madison). He expresses a hope that the senatorial system may work better than many contemplated. But (and to this I ask attention) the only check on the supremacy of small States is this: "*The larger States will always be able by their power over the supplies to defeat unreasonable exertions of this prerogative of the lesser States.*" Even in the act of advocating ratification of the Constitution Hamilton's candor admits that it introduces the principle of "PREROGATIVE," requiring a check similar to royal prerogative in England. When the second chamber was first constituted by the Convention, and while it remained as yet republican in basis, equal power of originating all bills was given it; but when it was made a peerage of States, the small States offered, as a concession, that the Senate should relinquish all power over the purse, in imitation of the British Constitution. This concession was receded from, but by the persistent efforts of Edmund Randolph it was recovered,—or supposed to be. The struggle was over the right to originate money bills; the second clause (Art. I. Sec. 7) "but the Senate may propose or concur with amendments, as on other bills" excited no suspicion. It passed *nem. con.*, which must have been impossible had it been supposed that the Senate would ever assert such power over the national purse as that with which we are unhappily familiar. The sentence in *The Federalist*, No. 62, is an authentic witness that Hamilton understood the exclusive power of the Representatives over supplies to be genuine, and intended to balance senatorial prerogative.

During the recent combat on the tariff, the New York *Evening Post*, whose legal opinions justly carry weight, contained the following editorial paragraph:

"Our constitutional provision on the control of the House over money-bills was confusedly drawn from English practice, and what that practice is was pretty

conclusively shown the other day in the action in the House of Lords on the budget. Some of its features were extremely distasteful to the Tory peers, and Lord Salisbury made an elaborate argument to show that the House of Lords had a constitutional right to amend a revenue bill. Lord Rosebery replied briefly and rather contemptuously that the only thing the House of Lords had to do with a money-bill was to take it as it came from the House of Commons, and this the noble lords proceeded to do meekly enough, despite all their wry faces. That essentially this absolute control of the power of the purse was intended to be given the House by the framers of the Constitution is beyond question. They never could have contemplated the possibility of the Senate's making what is practically a new bill under cover of the right to 'propose or concur with amendments.'"

In moving the question in the Convention Randolph said:

"First, that he had not wished for this privilege, whilst a proportional representation in the Senate was in contemplation; but since an equality had been fixed in that House, the large States would require this compensation at least. Secondly, that it would make the plan more acceptable to the people, because they will consider the Senate as the more aristocratic body, and will expect that the usual guards against its influence will be provided, according to the example of Great Britain. Thirdly, the privilege will give some advantage to the House of Representatives, if it extends to the originating only; but still more if it restrains the Senate from amending." (*Madison Papers*, III, p. 1297.)

But why did the Convention allow the Senate to amend money bills at all? It was on an admonition of Justice Wilson, a champion of just representation:

"The House of Representatives will insert other things in money bills, and by making them the conditions of each other destroy the deliberate liberty of the Senate. He (Wilson) stated the case of a preamble to a money bill sent up by the House of Commons, in the reign of Queen Anne, to the House of Lords, in which the conduct of the misplaced Ministry, who were to be impeached before the Lords, was condemned; the Commons thus extorting a premature judgment without any hearing of the parties to be tried; and the House of Lords being thus reduced to the poor and disgraceful expedient of opposing, to the authority of the law, a protest on their Journals against its being drawn into precedent."

With this reason for the Senate's right to propose amendments objections to it were met in ratifying Conventions. This is what the people voted for and adopted, and it is what never could have been unanimously offered them had it been imagined by the framers that the power of the Senate would ever be used on the purse itself, or for any other purpose than to restrain the representatives from

escaping the senatorial check on measures not pecuniary, by making them "riders" to money bills. The Senate has therefore long been exercising an unconstitutional authority in amending money bills pure and simple, and we are at this moment under a system of taxation really originated by the Senate.

Before me is a manuscript of Edmund Randolph, our first Attorney-General, in which he says concerning the Constitution, "Many powers were vaguely granted without regard to accuracy in their nature, and uncircumscribed in their extent. Whether this indefinite feature was the effect of accident or design has been and still is a subject of controversy." Justice Wilson, while persuading Pennsylvania to ratify, admitted that "in this system the distinction and independence of power is not adhered to with entire theoretical precision;" and he alluded especially to a degree of inaccuracy in defining the powers of the Senate. Now it is notable in our constitutional history that wherever there has been any such vagueness, the Senate has steadily appropriated the power involved. This process began at an early date, in the contest concerning the British Treaty, in 1795. The treaty was ratified by the Senate, though its opponents in that body represented a large majority of the people, and was signed by the President against the advice of his most eminent friends—Jefferson, Randolph, Madison, Hamilton, and others. The ratification of this treaty, virtually violating our treaty with France, by whose alliance independence was won, was felt by the people's representatives as an outrage, especially as at that moment English cruisers were seizing provisions on American ships. The House of Representatives, now required to make appropriations for carrying the treaty into effect, considered that the occasion had arrived for using, in the language of *The Federalist*, No. 62, "their power over the supplies to defeat unreasonable exertions of this prerogative of the lesser States." After long debate the House sent to the President a respectful request, moved by Mr. Livingston, for such papers concerning the treaty as it might not be injurious to pending negotations to disclose, the resolution passing by 62 to 37. The President refused, in a message of which Madison wrote to Jefferson, April 4, 1796, "The absolute refusal was as unexpected as the

tone and tenor of the message are improper and indelicate." The President says, "It is perfectly clear to my understanding that the assent of the House of Representatives is not necessary to the validity of a treaty;" but its assent was necessary to supply money for carrying it into effect.[1] The message was felt as the menace of a *coup d'état*, and the intimidated House surrendered. Such was the end of the first effort of the people's representatives to check a senatorial "prerogative" by their control over the "supplies."

The point so clear to the President, who was no lawyer, is one of extreme intricacy. During the discussion Chief Justice Ellsworth wrote an opinion that the papers could not be constitutionally demanded by the House, but that small-State enthusiast of the Convention holds a very small place in the annals of jurisprudence beside such men as Justice Wilson, Edmund Randolph (our first Attorney General), Jefferson, and Madison. Wilson said, in advocating a ratification of the Constitution by Pennsylvania:

"It well deserves to be remarked, that though the House of Representatives possess no active part in making treaties, yet their legislative authority will be found to have strong restraining influence upon both President and Senate. In England, if the King and his Ministers find themselves, during their negotiations, to be embarrassed, because an existing law is not repealed, or a new law is not enacted, they give notice to the legislature of their situation, and inform them that it will be necessary, before the treaty can operate, that some law be repealed, or some be made. And will not the same thing take place here?"

Jefferson wrote to Senator Giles, December 31, 1795:

"Randolph seems to have hit upon the true theory of our Constitution, that when a treaty is made involving matters confided by the Constitution to the three branches of the Government conjointly, the Representatives are as free as the President and the Senate were to consider whether the national interest requires their giving the form and force to the articles over which they have a power."

The House of Representatives having then allowed itself to be

---

[1] The only ground on which the House of Representatives had been denied by the Convention equal right over treaties was that such negotiations might require a secrecy inconsistent with their discussion in so large a body. (*Madison Papers*, iii, p. 1518.) There was no suggestion by any speaker that the Representatives might be bound to make appropriations for treaties, otherwise the clause, which had but one opposing vote (Pennsylvania), could never have passed.

browbeaten, it still remains undetermined whether a chamber not chosen by the people in conjunction with a President (often elected by a minority,—as Hayes, Harrison, and others have been) may not by treaty alienate the most important rights of the nation.

I am no worshipper of majorities. Wisdom is generally in the minority, but it is a minority of superior thought, intelligence, and character, which has fair chance to become a majority on any question proposed. Had our century of national experience shown that the representatives of Statehood were normally superior to the representatives of the people, or that our system, however wrong theoretically, worked well for the true welfare of the nation, my criticisms might be fairly regarded as merely academic. But the reverse appears to me the fact. That the prestige of the Senate has attracted to it more men of talent than reach the House may be admitted, but it has also attracted more self-seekers and mere plutocrats, who purchase places therein for which they are not fit. Moreover, talent, if devoted to reactionary aims, or personal ambition, is a worse enemy than stupidity. Fifty years ago, when the Senate was at its height of talent, its ablest men were cleverly defeating every effort of the nation's Representatives to restrain Slavery. We old abolitionists have long memories. I have heard the eloquence of Clay and Webster in the Senate, and was there when those famous orators, and their committee, in order to open to Slavery territories of which Mexico had been robbed, suggested the bribe which corrupted the first "Free Soil" House of Representatives. I do not suppose that more talent was ever displayed by a public body than in that infamy.[1] From the action of the Senate in 1850 came the struggles

[1] The Senate's proposal to organise all the territories "acquired" (robbed) from Mexico, except California, without restriction on the extension of Slavery into them, contained a cunning clause granting Texas money. The bait caught the House. After voting against the proposal by a majority of eight, it reconsidered, and passed it by a majority, with a "rider," paying Texas ten millions of stock redeemable in fourteen years, bearing five per cent. interest, payable half-yearly at the National Treasury. The public debt of Texas, largely held by members of Congress, suddenly rose from between twenty and thirty per cent. to par. "Corruption," says Greeley, "thinly disguised, haunted the purlieus and stalked through the halls of the Capitol; and numbers, hitherto in needy circumstances, suddenly found themselves rich." (*The American Conflict*, Vol. I, p. 208.)

in Kansas and ultimately the great civil war. During the entire anti-slavery struggle the Senate, instead of being that proverbial "saucer" in which legislation is cooled, was the arena of "fire-eaters," a place for the exchange of affronts, where debate proceeded under continual threats—not unlike those in the Convention which established the Senate—of breaking up the Union unless certain States had their sovereign privilege of extending Slavery throughout the national territory. If any one wishes to know whether the Senate has improved since then, let him read the terrible arraignments of that body by Professor von Holst in *The Forum* of November, 1893, and his oration printed in *The Monist* of October, 1894.

I have felt it necessary to tell something of the humiliating history of the origin and career of the Senate because it is only by such light that wise reform can be begun. There has been something like a patriotic conspiracy among historians to suppress the facts, which are buried in records long out of print. Here is ex-senator Edmunds writing in a recent *Forum* about the Founders:

> "They believed that the liberty and happiness of the people of the several States—States which they foresaw would finally embrace a continent in their benign sway—could only be preserved by such divisions and subdivisions, the sources and methods and exercise of political power as they adopted and provided for. A century of experience has demonstrated the wisdom of their marvellous plan."

The Founders' own words, cited above, proved that they believed nothing of the kind; that a large majority of them, and all of their really great men, accepted the plan against their judgment, with infinite disgust, under treasonable menaces of unpatriotic men; that they foresaw many of the evils which a "century of experience" has illustrated, confronting us this day with the fact that we are under the tyranny of a Prerogative less responsible and more liable to corruption than that which our Revolution overthrew.

I weigh again the words, and let them stand. In a letter to Lord North (February 5, 1778) George the Third wrote: "Lord George Germaine said to me this day that the Declaratory Act, though but waste paper, was what galled them [the Americans] most." This was true. Of that Declaratory Act (February, 1766) Thomas Paine wrote: "One of the greatest degrees of sentimental

union which America ever knew, was in denying the right of the British Parliament 'to bind the colonies in all cases whatsoever.' Taxation was nothing more than putting the declared right in practice." Parliament was an elective body, but America was not represented in it. Nor are the people of the United States represented in the Senate, which is able "to bind them in all cases whatsoever," and has just bound them with a system of taxation against which their Representatives and their President protested. But it was not the case in the British Parliament that its measures concerning America could be controlled by the ability of two or three easily bribed men to overrule both Crown and Parliament, by an obstructive power derived from the superstitious awe of the "prerogative" of those anointed by State sovereignty. The fact that colonies fresh from a seven years' revolution against vassalage could subject this nation to an assembly irresponsible to it, and not even able to carry into effect its own will against a clique—a little Senate, *imperium in imperio*—reminds us once more that real reforms are not secured by revolutions. Were the Senate uprooted to-morrow something almost as bad might possibly be planted next day.

And all sudden and sweeping changes partake of the nature of revolution. Thorough, permanent, and beneficent reforms must come by intelligent and purposed evolution. Natural selection breeds wolf and lamb impartially; human selection alone assures survival of the humanly fittest. Where a nation is largely enlightened, and its leading minds deeply occupied with national affairs, freedom and progress may be developed even by means of unpromising governmental anachronisms. Out of the irrational hereditary principle of the English Crown, carrying it sometimes to infancy and incompetency, Ministerial Government, at first a necessity, was developed into the only real Crown. The Lords, reduced to feebleness by the advance of democracy, have been turned to a really democratic purpose by English good sense, their House being practically the means of securing to the people their right to determine the measures by which they shall be governed. A party in the House of Commons lately passed a revolutionary measure by a majority hardly equal to the number of Ministers (who vote under

dictation),—a measure that was studiously kept secret before the elections. The Lords returned the measure, with a demand that it should be submitted to the people. It being probable that the people would defeat it, the measure has been necessarily relinquished. The anger of the defeated has been seized on by a parliamentary faction to revive the old siege against the House of Lords, but with no prospect of success. Formerly the existence of that House was assailed by radicalism with the hope of replacing it with a Senate, but since then our State Peerage has become a by-word to the world. Europe has just seen simultaneously the Great Exposition of our Civilisation at Chicago, and the Great Exposure of our Constitution at Washington. England will have no such thing. But sagacious men like Lord Rosebery perceive in the outcry an opportunity for developing the House of Lords another stage. By taking from it a fictitious veto, one it never ventures to exercise against a measure passed on by the people, its real suspensive veto may be definitely adapted to the new national needs and the conditions of party government.[1] England will then have a House independent of party interests and passions, not controlled by the *aura popularis*,—not subject to the transient fads, isms, and agitations which candidates must conciliate,—able to check either party in power by compelling it to consult the nation on important issues, and able to obtain from the people their maturer judgment. It is probable that the House of Lords, theoretically absurd, will come out of the present agitation the most useful second chamber in the world.

[1] A good many Americans seem to suppose that the repeated rejection by the Lords of the bill for "marriage with a deceased wife's sister" represents their claim to an absolute veto. Such is not the fact. Whenever the Commons have received back that bill from the Lords, they (the Commons) have accepted the decision without sending that particular bill again to the Lords. Had the Commons really cared for the bill at any session, and insisted on it, the Lords must certainly either have passed it or demanded a popular vote on the measure. The exceptional action of Parliament on this reasonable Bill is explicable by the fact that the Commons do not really like it, that it has never made part of any party's programme at the polls, and would probably be defeated by the people. It is desired by but few, and mainly royal personages. Its rejection in different sessions, the Commons not insisting on it, does not affect the fact that the House of Lords has not within this century practically asserted a right of absolute veto.

But whatever may be the fate of the House of Lords, it appears to me certain that, in the direction of its proposed reform, our Senate is to be altered as the first step. To deprive it of its power of absolute veto could not practically affect the internal interests of any State unfavorably. It would at once render the Senate less liable to perversion by the large interests which can now purchase the balance of power in so small a body. Votes that can merely suspend a measure are hardly marketable. And although it may be hoped that other organic changes will follow, (not, I trust, election of Senators by the people instead of Legislatures, which would but give a sham popular sanction to a fundamental wrong,) even if the Senators continue to be chosen as now, deprivation of their power to defeat measures permanently by brute force would probably draw to their assembly better men. When there is a chamber at Washington whose only weapons are argument, reason, knowledge, eloquence, we shall perhaps no longer suffer by the unwillingness of our thinkers and scholars to take part in those miserable combats for which their finest qualities constitute their unfitness, and in which their very virtues insure defeat.

MONCURE D. CONWAY.

NEW YORK CITY.

THE NATURAL STORAGE OF ENERGY.

THE content of the universe is called matter. Whatever has existence (*Dasein*) is material. Where matter is not there is nothing. It is the thing-in-itself. Its ultimate nature is not known, perhaps cannot be known, since knowing is an attribute of its most complex state. Its proximate nature, however, can be known, and the proper object of philosophy is to penetrate as far as possible into the nature of matter, i. e., to explain the universe.

The simplest hypothesis would seem to be that *the content of the universe consists of an infinite number of infinitesimal elements possessing fixed velocities.* The last part of this formula is not hypothetical, but is the essential truth of the established law of the conservation of energy. Moreover, it is not essential to the hypothesis either that the number of elements be infinite or that they be infinitesimal. The assumption is therefore reduced to that of the existence of such elements, which is the assumption upon which all science proceeds.

Space, time, and motion[1] are the three conditions (forms) under which matter exists, and all matter always exists under all three of these conditions. The existence of matter under the conditions of space, time, and motion constitutes its three fundamental *relations*, the extensive, protensive, and intensive. So far as human intelligence reveals the ultimate elements of matter they are perpetually impinging upon one another, which changes the *direction* of their motion without changing its *rate*; that is to say, the constant impacts

[1] It seems strange that Kant did not include motion, along with time and space, as a "form" of all phenomena of the external senses.

of the material elements alters their motions without altering their velocities. This alteration of the motion of matter is the effect of which the impact or collision is the cause. This is causation in its simplest form, and all cause and effect are reducible to it. The idea of force is essentially the same. Force is therefore a compound relation growing out of the three simple relations.

We thus have two categories, matter and relation, the distinction between which is absolute. A relation is immaterial, but it can only subsist between material things. Think away the latter and nothing remains. It may seem superfluous to illustrate this, but the fundamental error of all philosophy has been that of confounding matter with its relations. If one element of matter occupies a different position in space from another there arise two relations of coexistence, distance and direction. No one would call these material. If an element of matter be moving, the time required to pass from one point in space to another compared with an antecedent or subsequent period of time is a relation of sequence, which no one would think of regarding as material. If two moving elements collide, the collision is not itself material. It is an intensive relation. The change of motion produced by the collision is a compound relation, and although it cannot occur apart from matter, it can be thought apart from it, not as matter but as relation.

To show how prevalent is the confusion of matter with relation one only need consider the current theories as to the nature of matter. Such expressions as "centres of force," "collections of properties," etc., unwittingly rob it of existence. Eliminate matter and a centre of force is a centre of relation with nothing to be related. Properties are the forces that matter exerts. Remove matter and there remains nothing to exert force or manifest properties. Dynamism is a form of magic.

The unalterable inherent motion of all the elements of the universe is the fundamental source of all effects, the primal cause of all things—it is the true *causa sui*, *causa immanens*, or self-activity of the philosophers. The multitudinous forms in nature are the products of the inherent motions of the elements of which they are composed, and show that the series of causes and effects which have re-

sulted in the existing state of things possesses a somewhat orderly character, involving a tendency toward the production of systems and symmetrical forms. Primarily there is seen the tendency to concentration due to a principle of attraction among the elements. This may be designated the *gravitant* force. There is, however, at the same time an opposite tendency to dissolution due to a principle of repulsion among the elements. This may be designated as the *radiant* force. These two primary forces interact, and wherever suitably balanced they result in the formation of symmetrical bodies preserved by equilibrating forces. It is this that constitutes true *evolution*, best exemplified in the celestial systems—cosmic evolution—and in organised beings—organic evolution. But looked at from another standpoint, the process may be regarded as one of *organisation*, which is *chemical* up to a certain point, beyond which it becomes *biotic*. In the former the activities are *molecular*, in the latter they are *molar*. The products of the former are *chemical substances*, those of the latter are *organic forms*.

The essential principle of organisation, whether chemical or biotic, is the concentration or focalisation of the otherwise diffuse and little operative activities of the universe in the direction of enabling them to produce increased and definite effects. Each product represents a different mode of storing up the universal energy, so as to expend it in some single, definite direction with an effect corresponding to the degree of concentration. The principle may be illustrated by the increased power of the sun's rays after passing through a lens, the intensity increasing as the area upon which they act diminishes, or by that of an electric coil as compared with the diffused electricity of the air. Every substance is a sort of battery, capable of making effective the otherwise ineffective forces of its elements.

The forces thus condensed and stored up constitute what are called the *properties* of substances, and these properties differ according to the elements of which the substances are composed, that is, according to their constitution. These properties differ quantitatively as well as qualitatively. There are many degrees in which the elements of substances may combine, the resultant combinations

becoming the units of higher degrees or orders of aggregation. The power of substances to produce effects is great in proportion to the degree of organisation.

Passing over the universally diffused and apparently homogeneous interstellar ether, which is the least concentrated form of matter about which anything is known, we seem to detect such degrees in what are called the chemical elements, as evidenced by their different atomic weights, and it is probable that the elements having smaller atoms combine to form those having larger ones. The properties of the latter class are thus rendered proportionally more effective, or, as it is said, more active.

The next stage is attained by the inorganic compounds, i. e., substances composed of chemical elements in various combinations. These differ from the elements of high atomic weights only in the fact that they are capable of artificial dissociation, by which their constitution can be determined. Being, however, of a higher degree of organisation their properties are proportionally more active. The inorganic compounds differ very widely from one another in their degrees of organisation, since this class includes not only those whose combining units are the different chemical elements, but also those which are made up of other inorganic compounds of lower degrees of organisation.

The third stage is that at which the so-called organic compounds appear. This, however, is probably only a convenient classification. It was formerly supposed that all organic compounds were the result of biotic conditions, the products left from the destruction of organised bodies, falling back to a plane intermediate between the purely chemical and the biotic. Such products there certainly are, but there are now known to be many organic compounds which are not so produced, and which can be artificially formed in the laboratory out of their inorganic constituents. The organic compounds also differ immensely in their degree of composition and correspondingly in the activity they display. Their properties differ greatly in their modes of manifestation, taking the form of astringents, narcotics, toxics, etc., in the vegetable alkaloids, and that of instability, changeability, and finally of isomerism in protein,

casein, hemoglobin, and other albuminoids. In each of these ascending stages the capacity for producing effects is enhanced.

Throughout all the stages thus far considered the only activities manifested are molecular. However large the molecules, those of albumen being equivalent to about five thousand hydrogen atoms, their power to act is confined to that which these exert within the systems which in each case characterise their chemical constitution. But this process of molecular recompounding is in the nature of things limited. The combining units become at length so large that they can no longer move among themselves without influencing the mass. This stage, that is, the stage at which molecular is transformed into molar activity, is reached with the appearance of the substance called *protoplasm*. This substance is probably a product of the recompounding of the albuminoids, which represent the highest degree of molecular activity. Protoplasm, therefore, which is the last or highest stage of chemical organisation, may also be regarded as the first or lowest stage of biotic organisation.

The leading property of protoplasm, as already intimated, is its power of spontaneous movement as a mass, which is simply a result of its internal constitution. The difference between spontaneous molecular and spontaneous molar activity is simply one of degree, and the latter phenomenon only surprises those who have not reflected on this fact.[1] It is admitted by all who have studied the constitution of matter that its elements are in a state of constant and perfectly spontaneous activity, but this is only perceptible to sense in the forms of heat, light, electric shock, weight, etc., in none of which is the actual movement among the particles within the range of the organs of sense. Therefore when this motion comes to be conveyed to the mass so as to be visible to the eye it is supposed that some entirely new principle is in operation. The illusion is dispelled by a very little thought devoted to the subject.

This spontaneous mobility manifested by protoplasm is tech-

[1] This is the fundamental fallacy that runs through Dr. George M. Gould's exceedingly original and highly readable book, *The Meaning and Method of Life; a Search for Religion in Biology* (New York, G. P. Putnam's Sons, 1893), and neutralises the greater part of its contents.

nically called *motility*. It is the fundamental fact contained in the idea of *irritability*, as treated by Lamarck,[1] which, carefully analysed, is seen to consist in nothing else, that is, when kept wholly separate from sensibility, as Lamarck seeks to do. This, however, can only be done in thought. As a matter of fact irritability and sensibility always co-operate, are, indeed, but different aspects of the same fact. They constitute the initial stage of the relation which ultimately subsists between brain-states and states of consciousness, between neurosis and psychosis. The explanation of the origin of sensibility is that protoplasm is of such an unstable and delicate nature that to secure its permanence it must possess some protecting quality and sensibility is such a quality. It is probably the only one that would have served the purpose. To some it may seem that this makes it necessary to invoke design in order to endow it with such a property, but the leading principle of modern biology obviates this. It teaches that protoplasm could not have come into existence at all without this property. If there had been no such property there would have been no protoplasm, no life, no organic world. The same reasoning does away with the necessity of predicating sensibility of the simpler forms of matter, those whose activities are wholly molecular. These are so much more stable that no such quality as sensibility is required to preserve them. It need not, however, be dogmatically denied that ever diminishing degrees of sensibility may pass down into even the simplest forms of matter.

As already remarked, chemical organisation ceased and biotic organisation began with protoplasm. It is the only vital and psychic substance, the true life- and mind-stuff, and all further progress in focalising and utilising the universal energy has resulted from the organisation of protoplasm so as to multiply its power. This has consisted in a series of mechanical adjustments. In the organic world protoplasm is the power while *structure* is the gearing which concentrates that power. Although protoplasm exists in every cell, the main lines through which it works are the nerves, which, in the

---

[1] *Philosophie Zoologique*, éd. Martins, Paris, 1873, Vol. I, pp. 8, 398; Vol. II. pp. 2, 37ff.

higher organisms, consist of large trunks with numerous local reservoirs and innumerable branches permeating all sensitive tissues.

In order that sensibility accomplish its purpose, the preservation of the organism, sensations must be either agreeable or disagreeable ; hence pleasure and pain. The instability of protoplasm renders every part ephemeral. The entire organism is in a state of constant and rapid change of substance (metabolism), and fresh supplies must be momentarily introduced to prevent destruction by waste. The biological principle of advantage is adequate to secure this end. The supply of tissue is attended with pleasure and the actions necessary thereto follow naturally. The same is true of reproduction, which a study of the lowest organisms shows to be theoretically only a form of nutrition. The origin of pain is even simpler. The destruction of tissues results in pain and the actions necessary to prevent it also follow naturally.

Pleasures and pains once experienced are remembered, i. e., they are represented when not present, and there arises a disposition to repeat the former and to avoid a repetition of the latter. This is *desire*, and it becomes the prime motive to action. The organism necessarily acts in obedience to desire, or if there be several desires that interfere with one another it acts in the direction of their resultant. Hence the conative faculty or *will* so called.

Up to and including this stage the *cause* of all activity is generically the same. It is the efficient cause, the *vis a tergo*. *Motive* must be distinguished from *purpose*. Desire and will are simply motive. It is a natural force and does not differ except in degree of complication from any purely mechanical or physical force. But evolution has gone on to another stage. In much the same way as, by adopting a new method, it passed from chemical to biotic organisation, it has, by making another new departure, passed from genetic to telic causation.

The direction of progress was seen at the outset to be toward the greater concentration of cosmic energy, toward making the universal force, whose quantity cannot change, perform more work. This law continues in operation to the last. Telic causation is only another way of accomplishing this end. Just as biotic organisation

was called in where chemical organisation could go no farther, so teleology is resorted to at the point where genesis ceases to be effective. In the last stages before this point is reached the chief agent in nature is will, but, as already stated, its action is direct, the same as mere force in any other form. The new agent differs primarily from all others in being *indirect*. The essential characteristic of the final cause is indirection.

It is a common figure to represent any force as blind. The conative force is still more frequently so characterised. Desire sees no obstacles. Love is blind and blind impulse rules the lower world. But while results are accomplished by this direct method according to the intensity of the impulse and the strength of the organism, it is evident that there is a limit to the achievements of will. Desire must go unsatisfied if its object cannot be attained within this limit of physical strength. With the advance of biotic organisation desire increases more rapidly than does the power to overcome obstacles, and the number and magnitude of the obstacles to the attainment of desired ends thus rapidly increase. Any new advance must look to overcoming these difficulties and to clearing the way for the accomplishment of higher results. Still again the biological law of advantage comes forward. The new device is the *final cause*. It consists of a mechanism for the utilisation of force that is running to waste, and in this respect the economic principle of all evolutionary progress is employed, but the application of this principle is wholly unlike any hitherto made.

The conative power was seen to reside in an organised nervous system with an increasing integration of its parts in subordination to a general directive centre, the brain. The physical progress continued to all outward appearances unchanged except in degree in passing from the conative state which is genetic into the noetic state which is telic, but by insensible degrees a new psychic faculty was evolved. This new psychic faculty in its developed state is called the *intellect*, but it had its nascent and inchoate stages which, though the same in essence, scarcely deserve that name. The name, however, is unimportant. It is only needful to understand its nature.

Its physical nature may be safely said to be unknown. A the-

ory is that there takes place within the substance of the brain a miniature reproduction of the entire panorama displayed by the external world to the organs of special sense, which register all impressions and preserve them for future comparison and use. The mind itself thus actually *feels*, or, as it were, *sees*, not only all that is presented to the senses but all that has been so presented in the past, or so much of it as it has the power to retain. The simultaneous felt presence of so many impressions renders it possible to make comparisons and recognise differences and samenesses. It thus declares agreements and disagreements, which constitute the basis of all *thought*. Agreement of wholes is identity, agreement of parts is similarity. These are the fundamental relations, but there are many kinds of relations, and the intellectual process *per se* is the *perception of relations*.

How, then, does this simple faculty of perceiving relations become a new power in the world for the storage and use of the universal energy? What is the precise form of indirection that so greatly multiplies the effect produced? Is there anything essentially new in the nature of the force constituting a final cause? To the last of these questions a negative answer must be given. There is only one *genus* of cause in the sense of a force, and that is the direct impact. The difference between efficient and final causes must be sought in the mode of their application. While the final cause, as its name implies, is inspired by an end in view, it is in reality not directed toward that end. In mere motive or will, unaided by the intuitive faculty, the force of the organism is so directed, but for want of this faculty it may fail to attain it. The telic power differs essentially from the conative power in being directed not to the end but to some *means* to the end. Intelligence works exclusively through means, and only in so far as it does this does it employ the final cause. Instead of seeking the thing desired it seeks some other thing, unimportant in itself, whose attainment it *perceives* will secure the thing desired. This is the essence of intellectual action and all that constitutes a final cause. It is the process of converting means into ends. It thus becomes necessary that the means be *desired*, otherwise there is no *force* for the accomplishment of re-

sults. So far as the pursuit of the means is concerned the action is purely conative and does not differ from that which pursues the end directly. The whole difference consists in the *knowledge* that the end will follow upon the means. A final cause, therefore, stripped of its manifold concomitants which so obscure its true nature, consists in the pure intellectual perception that a certain end is attainable through a certain means. But this is simply saying that in and of itself it is not a cause at all. Knowledge is merely a *guide* to action. Intellect is a directive agent and can no more be called the cause of the result accomplished than the rudder can be called the cause of the progress of a boat.

There are all degrees in the amount of indirection involved in teleological action, from a mere *détour* necessary to avoid an obstacle to the highest feats of engineering, in which each separate part, say, of a Ferris wheel, must be wrought and put together to make the perfect structure which exists in the mind before the first step is taken. In this latter illustration every effort put forth from the beginning to the end is a direct conative act applied to a means. But the work as a whole is telic, the end being constantly in view. And such is the nature of the entire course of material progress achieved by man. It is by this that he is primarily distinguished from the rest of nature. The human intellect is the great source of telic activity. The works of man are the only ones with which we are acquainted that proceed in any considerable degree from final causes. But if there be any other source of final causes, the process must always be the same—efficient causes applied to means.

It was observed at the outset that in the case of genetic phenomena, i. e., of efficient causes, the effect, if the impinging bodies are inert, is always exactly equal to the cause. This is also true of final causes, so far as their action upon the means is concerned, but the *final* effect, if it can be so called, is usually much greater than the cause or effort expended. Wherein consists this difference? How has the force exerted acquired this increased efficiency? The answer is easy. The final cause is the mind's knowledge of the relations that subsist between the means and the end. But the chief

of these relations, and the only practical one, is the action of other natural forces outside of the agent's will-power or muscular strength. What the mind sees is that such forces exist and are operating in certain directions. What the intelligent agent does is to place the thing he desires but lacks the power to move into the current of such a force which moves it for him. This is the type of teleological action. It is illustrated in its simplest form by the lumberman who puts his logs into the river and lets the current float them to their destination. But the most complicated cases may, by proper analysis, be reduced to this simple principle. Teleology is essentially the utilisation of natural forces, causing them to do what the agent perceives to be useful and wills to be done. The applications of wind, water, steam, and electricity are this and nothing else. All machinery falls into the same class. Civilisation in all its material aspects is but the expression of this truth.

It thus appears that the course of evolution as above sketched has been in the direction from the unorganised and inefficacious toward the organised and efficacious through the process of storing energy in appropriate forms. This has taken place by a series of successive steps, each resulting in a more efficient product, that is, one possessing, in addition to the properties of antecedent products, some new property with a special power of its own capable of better work. The new property may be called its *differentia*, or differential attribute. The thought is embodied in the well-known phrase of Linnæus: *lapides crescunt, vegetabilia crescunt et vivunt, animalia crescunt, vivunt, et sentiunt;* to which might be added: *homines crescunt, vivunt, sentiunt, et cogitant.*

It is possible to arrange these several products of evolution in their ascending order of development, assigning to each the particular property by which it is distinguished from all below it—its differentia. There are also certain other special attributes that require to be taken into consideration. These are of three kinds: the nature of their *activities*, the *phenomena* they manifest, and the *cause* through which they work. For example, all activities are either molecular or molar, all phenomena are either physical, vital, or psychic, and all causes are either efficient, conative, or final. The

products themselves have already been enumerated in the order in which they must stand. The universal ether may be placed at the bottom of the scale as representing the most diffuse form of matter with the least power, when not concentrated, of producing effects. Next come the chemical elements, which form a class, although they might themselves be arranged in an ascending series. The inorganic compounds naturally follow the elements, and the same remark applies to them. The organic compounds differ from the inorganic still less than the latter differ from the elements, but they belong above them, and like them, only to a still greater degree, exhibit gradations in efficiency. Protoplasm is their highest expression and spans the chasm between the chemical and the biotic planes of existence. It makes the plant possible and prepares the way for the animal. At the head of the animal series and of the entire system stands man.

The classification thus sketched may be put in the following tabular form :

PRODUCTS	DIFFERENTIAL ATTRIBUTES			
	PROPERTIES	ACTIVITIES	PHENOMENA	CAUSES
Man	Intellect	Molar	Psychic	Final
Animals	Feeling			Conative
Plants	Life		Vital	
Protoplasm				
Organic Compounds	Elective Affinities	Molecular	Physical	Efficient
Inorganic Compounds.				
Chemical Elements				
Universal Ether	Wave Motion			

To the general proposition that properties increase in activity as the constitution of the substances manifesting them increase in complexity, it has been objected that there are certain very complex substances which are at the same time rather inert, as for example, clay; while there are certain simple chemical elements, such as oxygen, that have very active properties.

The first of these objections is simply a misconception of what is meant by complexity. The mere stirring together of heterogeneous materials without natural affinities is not complexity, but confusion. The only complexity contemplated is organised complexity. The substance, to manifest active properties, must be a system so integrated as to put forth the combined energy of all its constituents. This, all true chemical substances are believed to do, which is the reason for the law. But it is not the case with clay and most rocks and "minerals," or of any mere mixtures, whether natural or artificial. Unless a substance has formed itself through its own attractions and natural adaptations it does not come within the class of complex substances under consideration.

The second objection, viz., that those properties are most active whose effects are most manifest or obtrusive, is due to the same qualities of mind which look upon gaudy colors as superior to subdued ones, or a noisy person as more important than a quiet one. Oxygen, it is true, has powerful affinities for a great many other substances and has literally reduced nearly the whole earth to ashes by a process of *eremacausis*, but it is the sword of Attila, and not the spirit of progress. The fitful spell of activity is quickly followed by the embrace of death. Neither is the idea of activity to be gauged by the power to destroy living tissues or to produce effects upon sense in any form. If this were all, the most complex of chemical substances would be the least active. It is the power of doing work that increases with organisation. The power of the albuminoids takes the forms of instability, isomerism, and general adaptability to use in forming tissue and contributing to organic life. Protoplasm itself has no destructive power. Its activities are wholly constructive, and hence infinitely higher than those of oxygen, or even of the most virulent poison. It is life and not death that costs. A bull in a china shop may annul in a moment the result of years of skilled labor. The destructive work of nature is universal, its constructive work is local and limited. The power to create is pitted against the power to destroy. Life is an effort directed against the universal tendency toward death. Expressed in cosmical terms it is the struggle of the radiant forces with the gravitant forces, and is

the result of the interaction of these two forces, neither of which acting alone can produce it. The active agents in this warfare are the several combinations that I have enumerated—the storage batteries of nature. Ethereal vibration, chemical affinity, motility, vitality, sensibility, will, intellect—these are the ascending steps in the cosmical series, and at each step the operative power of nature is increased.[1]

A great deal has been said, and is still being said in certain circles, about a counter-force to gravitation, which is conceived as something quite different from the radiant energy as explained above. It is claimed that mind is such a force and is capable under suitable conditions of causing ponderable bodies to rise into the air against the force of gravity. To this alleged force has been given the name of *levitation*. It seems very strange, if such a force exists, that it cannot be demonstrated by the strict laws of physical experimentation in such a manner as to render its acceptance universal, as much so as the fact of magnetism, which, I am bound to say, had it not been apodictically proved, would be equally improbable *a priori*. Be this as it may, I merely wish to say that if such a force actually exists it possesses nothing antagonistic to the principles here laid down. We know that an organised living body is a reservoir of force. That of man, it is true, so far as its direct physical manifestation is concerned, is, even relatively to his size, comparatively small. His power, as has been shown, is chiefly indirect or teleological. But so far as most persons have had an opportunity to observe it, this force is only manifested through the organised system by means of a nervous apparatus directly attached to muscles, tendons, bones, joints, and limbs, which, in an equally direct mechanical way, seize upon material objects that are present and in immediate contact. This must be done to the means even in the most effective applications of the final cause. The simple question is whether there is another way, similar to that of a magnet, by which the stored-up energy of an organised system can act, ap-

[1] These views may be regarded as a slight amplification of those expressed in an article on "Cosmic and Organic Evolution" in the *Popular Science Monthly* for October, 1877 (Vol. XI, pp. 672–682).

parently at a distance, but really through the ethereal content of space, and thus counteract the force of gravitation, which likewise acts through the ethereal content of space. There is nothing antecedently impossible, or even improbable in this, only it requires to be demonstrated to the satisfaction of all and put in the way of verification at will.

There can be no such thing as action at a distance. The magnet or the electric discharge does not act through absolutely void space. This is unthinkable. There probably is no such thing as space that is not occupied by some form of matter in some such sense as the atmosphere or any gas occupies space ; not an absolute *plenum*, for this would negative motion, but a partial *plenum* with ample room for the action of particles. It is through space thus occupied that the gravitant and radiant forces must act, and if there is a levitant force it must act through the same medium. The savage thinks the wind immaterial—spirit—as did the founders of language the world over. We have got beyond that stage of culture, but most men are still savages enough to believe that a stone falls to the ground through some immaterial or spiritual power. Another forward step in cosmical conceptions must be taken and it must be realised that there are ethereal as well as aerial storms, disturbances, and activities, and that no phenomenon can take place except by the impact or collision of moving matter, which is the essence of all force or energy, and the only *cause* in the universe.

Laplace has somewhere said that the discoveries of science throw final causes farther back. It would be more correct to say that such discoveries push final causes farther forward. They certainly tend to indicate that man's work alone displays design, and that all conceptions of teleological action outside of man's work are anthropomorphic. The inherent activity of all the elements that make up the content of the universe did not rise above the molecular plane until protoplasm was reached, and up to that point all phenomena were merely physical. While sensibility may be theoretically predicated of protoplasm and may be said to accompany all vital phenomena, it is only at its lowest stage throughout the vegetable world, and nothing that deserves the name of psychic is

found below the animal stage of development. Psychic phenomena are subjective and non-selfconscious throughout the subhuman realm of life, and only the incipient stages of intellectual perception are reached by the highest animals. None but efficient causes are operative until man appears and in his less developed condition, as also in the purely animal state, the power exerted is purely conative—the struggle of the unguided will. Not until the full-orbed reason comes upon the scene does the telic force at last gain sway and begin its triumphant career.

In a very general sense it may be held that cause and effect are always equal, but from the standpoint of the present discussion all progress is due to the increasing difference between effect and cause. This results from the successive differential attributes which are superadded at each evolutionary step. These modify the susceptibility of the products, causing them to react more and more vigorously at each step. The law of the equality of cause and effect ignores these increments of stored energy and assumes absolute inertness in the impinging bodies. But when these increments of energy are taken into account, the effect of impacts loses its simplicity and becomes at length incalculably complex, being in fact the resultant of all the properties involved. To the power from without is added the power from within. There are actions, reactions, and interactions, until in the higher stages of biotic organisation, and especially in the domain of final causes, the disproportion between effect and cause becomes enormous, as, for example, in the case of the lever and fulcrum. This often puts it beyond all power to calculate results. In the domain of purely mechanical causation that controls the heavenly bodies, it is possible to predict remote future events. The astronomer can, as it were, write the biography of the solar system in advance, as is done in computing the nautical almanac so many years ahead of date, but who could write the biography of a new-born infant? Great indeed is man's power of prevision under science. The motions of the planets can be foreknown for an indefinite future, physical and chemical effects are accurately deduced from the known laws of these sciences, the rate of growth and multiplication of plants and animals can be approximately ar-

rived at, the psychic activities of animals can be counted upon with sufficient definiteness to be of great value to man, even the feelings, emotions, and propensities of human beings, with their resulting actions, can be rudely presaged, and the will itself reduced to very general laws; but when an attempt is made to bring the intellect under the dominion of law, to calculate the orbit of the reason, to determine the path of a thought, all rules of the calculus fail. It is here and not in the will that the nearest approach to freedom is to be found. In all other departments there is some limit to the causational influence, but in the department of the higher mind, where all other forces in nature are brought under subjection, the possibilities are practically unlimited. A brilliant French writer has said that human thought is the sum of all the forces of nature. This is true in the sense that it is the master of nature, although in any strict sense it is not only not a force, but it is not even a cause. The final cause is not itself a cause, it is the appropriation of all causes.

LESTER F. WARD.

WASHINGTON, D. C.

CHRISTIAN MISSIONS.

A TRIANGULAR DEBATE, BEFORE THE NINETEENTH CENTURY CLUB OF NEW YORK.

THE Right Reverend Mr. J. M. THOBURN, Missionary Bishop to India and Malaysia, said :[1]

Most of the opinions formed with regard to missions, as far as India is concerned, are very superficial, and you have to bear in mind that no person can form an intelligent opinion on them unless he has been there himself and seen the work more than once.

If you go to India, a country as large as all the United States east of the Rocky Mountains, and a country like Europe, made up of many different nationalities, speaking languages differing very much in character ; and some one who has happened to have as a servant a Christian convert, tells you that the missions are not worth much, that a convert is a great deal worse after baptism than he was before ; that it does not mean anything there to be a Christian convert, you must distinguish between the converts of the real missions of India and the lineal descendants of the people who were Chris-

[1] Mr. Walter H. Page, President of the Nineteenth Century Club, writes of Bishop Thoburn : "Remarkable success has crowned the mission work in his charge. He has organised many churches even as far away as Rangoon and Singapore. During the last few years converts have been received into his churches at the rate of about fifteen hundred a month, or fifty for every day of the year. The work of providing for this large number of converts, furnishing the necessary teachers and building up the churches, is sufficient to tax all his energies. He has written several books, notable among which are *My Missionary Apprenticeship* and *India and Malaysia*." As Bishop Thoburn sailed for India on the next day after the debate he has been unable to read the proofs of his address, which has been condensed from a stenographic report.

tianised by force about two and a half centuries ago. There are in India over two hundred thousand of such Christians, but we never reckon them as converts. The French and Dutch, and especially the Portuguese compelled people to become Christians, but that is not missionary work at all.

When the English government first assumed power in India they refused to let missions be introduced, which, though eminently discreditable to their courage, was a fortunate thing, for if they had introduced missions themselves they would have been badly mismanaged. As the union of Church and State is fatal anywhere in Christendom, it is especially fatal in a heathen land ; and you would have had the extraordinary spectacle of Warren Hastings and Lord Clive trying to convert the people of India. They would have made them Christians indeed ! And then you would have had a great deal to say as to what Christianity does for the heathen.

The missionary enterprise which I have devoted myself to, a work which I always thought has not been sufficiently valued, and perhaps not correctly estimated, began about one hundred years ago. A shoemaker named William Carey was the first great leader of the movement, which required one generation to get it fairly under way, and consequently, when you come to look at the situation you will find that we only have about two generations of missionary labor upon which to pass an opinion.

Numerically we have not succeeded as well, I think, as the Christians of the first century did. I think, although there is a good deal of guess in it, Renan's estimate was that, at the close of the first century there were probably not more than two hundred or three hundred thousand people Christians in the world, and the best authorities of the present day put the number surprisingly low. We have between six and seven hundred thousand at the present day in India. It will be said that they are not visible to those that go there ; and they are often spoken of very contemptuously and by none more contemptuously than by cultivated, educated Indians themselves. You will be told that they are all low-caste, all ignorant, all very poor, that they have no influence, and never can have any influence. Please remember that, at the end of the first cen-

tury, there were only about half a dozen really able leaders of the Christian Church whose names have come down to us, and I am not sure but I have put the number rather high. At that time you could not have found five men of thought in the Roman Empire who could have told the name of the founder of Christianity. They did not know in Rome the difference between a Jew and a Christian, and the distinction was not known to most of the rulers of the Empire. We always imagine that the early Christians had been great men. There were among them not many; and the constant reproach of the day was that the great mass of the Christians were slaves.

Now, in the first place, the majority of our Christians in the missions I am superintending are composed of very poor people, and of low-caste people; and when that is brought forward as an objection, my reply is: That is accounted for by the fact that we are Christians. It is Christianity that we are planting there. If we had not the poor, and if we had not the outcasts, then you might intimate to me that I was not a Christian, and that we are not planting Christianity there, but Mohammedanism or some other cult. When the Founder of Christianity came, you will remember that he announced from the first that he came "with good tiding to the poor." You never saw a poor man. The poorest tramps that I meet on the street here, would be swells in India. We are receiving converts at the present time at the rate of about fifty every day. While you are sleeping to-night our missionaries in India will receive fifty converts to Christianity; and I suppose forty-nine of them will be so poor that the average income of each family would not amount to six or seven cents a day; and that is what it will be all through life.

The question will be asked: What can these poor people do? The question is, not what can they do, but what can *we* do?

In the first place, we are going to enrich them. The trouble with the extremely poor people is that poverty can be accounted for only in one way. It is owing to moral causes. We cannot find gold mines for the poor, but if we stamp the right kind of character into them they begin to rise.

It will be said: "You cannot make men out of those degraded people." Well, did you ever try? I have, and I say, do not despise them. I remember one time, it was in 1868, when I went out to a station to administer the Lord's Supper in a village. A great many of the converts were thieves, and the caste they belonged to consisted largely of professional thieves. Stealing is looked upon in this country as a base and gross sin, unless it is done in legal form; but out there it is looked on otherwise; and when I saw these poor people, the thought came to me: We can never build up Christianity here, when the foundation must rest on thieves and criminals. It did not occur to me at the time that when our Saviour died, there was a thief on his right hand and one on his left.

I have lived to lay my hands upon two of those men and ordain them as ministers of Christ. Forty-five hundred of them, who have become Christians, are so elevated that their neighbors have forgotten that they were ever anything else but Christians. One of them, who was the son of a sweeper,—Mr. Gandhi knows what that means; there is no depth deeper than that,—I have seen that man coaching Burmese and Mahommedan young men and boys for university examinations. He is now the principal of a high school, and I have seen men educated by him taking responsible positions. Therefore, I know that these people *can* rise.

There are fifty millions of people in India who are what we call "low caste"; they are below the line of social respectability; they have no more chance than the colored people in South Carolina have in the white schools of the country. Although the law professes to admit all on equal terms, they cannot go to an ordinary school. In a remarkable article I was permitted to read, on the Common Schools of India, written by an Indian gentleman of education, he says: "Nothing can be done for these people, unless the missionaries do it," and he admits what they have been doing for them.

Those are the people among whom we work. Missionaries are opening out a doorway, and they are coming in. We have brought the cost down cheaper and cheaper, until now I will take ten boys or ten girls who are baptised, and I will put them in a boarding-

school, clothe them and feed them and educate them for the sum of ten dollars a year for each one. Is there anything cheaper in the world? And they will be better off than ever before.

Another word with regard to women. A woman's intellect has always been regarded as exactly the same as the intellect of an outcast. The low-caste man is not supposed to have an intellect, neither are women supposed to have one; consequently they never have any opportunities. And I don't see how there can be any opportunities under the Hindu system. There would be a better chance for them if the Hindus were Buddhists, but we have no Buddhists in India now. Missionaries introduced the education of women in India, and have done it successfully.

It is my own deliberate opinion that, before the middle of the next century, the world generally will recognise the missionary movement as the greatest movement of the world.

* * *

MR. VIRCHAND R. GANDHI[1] said:

When I say anything against Christian missions, please understand that I do not refer to Bishop Thoburn, whom I regard with great respect and friendly sympathy. There is nothing personal in my remarks at all.

Christian missions to India imply that India is a land of heathens, and, therefore, stands on the same level with the Andaman or the Fiji Islands. That a country which has been recognised in all ages the world over as the mother of all religions and the cradle of civilisation should be considered as pagan, shows how much ignorance prevails in Christendom.

Since the Parliament of Religions, I have been studying Christian institutions, and I have also studied the way in which the Christian ministers and the missionaries are manufactured in this country, and have learned to pity them. We must not blame them

[1] Mr. Virchand R. Gandhi, a barrister of Bombay, came to the United States to attend the Parliament of Religions at the World's Fair in 1893, as a representative of Jainism, a faith older than Buddhism, similar to it in its ethics, but different from it in its psychology, and professed by several millions of India's most peaceful and law-abiding citizens.

too severely, because their education is too narrow to make them broad-minded. I grant that they are good-hearted, that they are good husbands and often fathers of large families, but generally they are very ignorant, especially of the history of civilisation and of the philosophy of religion of India. Most of them do not even know the history of ancient India.

We know that in this age of competition, centralisation, and monopoly, very many people are forced out of business. The English say, "The fool of the family goes into the Church"; so that when a youth is unable to make a living, he takes to missionary work, goes to India, and helps to introduce among the Hindus the doctrines of his church, which have long since been exploded by science.

When I arrived in this country, I first came to know from missionary sources that in India women threw their babies into the Ganges, and that the people of India threw themselves under the car of Juggernaut. No one ever invented a more barefaced falsehood or more malicious slander. Listen to the following hymn, which is quoted from *Songs for the Little Ones at Home*:

"See that heathen mother stand
Where the sacred current flows;
With her own maternal hand
Mid the waves her babe she throws.

Hark! I hear the piteous scream;
Frightful monsters seize their prey,
Or the dark and bloody stream
Bears the struggling child away.

Fainter now, and fainter still,
Breaks the cry upon the ear;
But the mother's heart is steel
She unmoved that cry can hear.

Send, O send the Bible there,
Let its precepts reach the heart;
She may then her children spare—
Act the mother's tender part."

The song is illustrated by a picture which heightens the horrible effect, and there are several other songs written in the same

spirit.[1] Such heart-rending stories help to swell the collections. We read in the same hymn-book, on page 246:

"Both missions and schools want money, I know."

And another song starts with these words:

"Should you wish to be told the best use of a penny,
I'll tell you a way that is better than any."

We all understand that the debasement of a nation's coinage is very pernicious and must prove disastrous to its commerce. How much more dangerous is the debasement of the spiritual coinage! All religions worthy of the name are now making great efforts to purify their doctrines and return to their original standpoint,—all except Christianity! You surely know that the nineteenth century Christianity is not the religion taught by Christ. Christ's religion has been changed and corrupted. But Christian clergymen are well aware that if they were to attempt to purify Christianity and bring it back to the religion of Christ, the result would be to reform it out of existence. Christianity stands to-day completely explained. Every step in its development is laid bare and shown to be due to purely natural causes, and it is easy to see how much Christianity adopted from other and older religions.

The central ideas of Christianity—an angry God and vicarious atonement—are contrary to every fact in nature, as also to the better aspirations of the human heart; they are, in our present stage of enlightenment, absurd, preposterous, and blasphemous propositions. Christians well know that the much-decorated statue of the Church, as it now stands, is not of pure chiseled marble, but of clay, cemented

[1] In reply to Mr. Gandhi's statement on infanticide in India the Bishop said: "That verse from the hymn that was read about the mother who throws her child into the Ganges has a little history. When missionaries went over first, a hundred years ago, the mothers *did* throw their children into the *lower Ganges*; but never did throw them into the upper parts of the stream. I have frequently corrected that mistake, and told them that they no longer throw their children into the Ganges now. Unfortunately for Mr. Gandhi, there is an English law which prohibits throwing children into the Ganges. Would that law have been made if it had never been done?"

Mr. Gandhi maintains that it is only a missionary calumny to excite the sympathy of credulous Christians; he says that he has studied the whole criminal law of India but it does not in any place refer to the throwing of babies into the Ganges; because there *never was* such a custom at any time in the history of India.

together by blood and tears and hardened in the fires of hatred and persecution. And still we hear the cry, "The whole world for Christ."

What benefit have the Hindus derived from their contact with Christian nations? The idea generally prevalent in this country about the morality and truthfulness of the Hindus evidently has been very low. Such seeds of enmity and hatred have been sown by the missionaries that it would be an almost Herculean task to establish better relations between India and America, had it not been for the Parliament of Religions and the spread of liberal thought from its platform.

If we examine Greek, Chinese, Persian, or Arabian writings on the Hindus, before foreigners invaded India, we find an impartial description of their national character. Megasthenes, the famous Greek ambassador, praises them for their love of truth and justice, for the absence of slavery, and for the chastity of their women. Arrian, in the second century, Hiouen-thsang, the famous Buddhist pilgrim in the seventh century Marco Polo, in the thirteenth century, have written in highest terms of praise of Hindu morality. The literature and philosophy of Ancient India have excited the admiration of all scholars, except Christian missionaries. Max Müller has said:

"If I were asked under what sky the human mind has developed some of its choicest gifts, has most deeply pondered on the greatest problems of life, and has found solutions of some of them which well deserve the attention of those who have studied Plato and Kant—I should point to India."

The wonder is that notwithstanding these foreign attacks and the demoralising influences of foreigners, India and her people have survived: India still leads in spirituality and morality. Sir T. Monroe says:

"If a good system of agriculture, unrivaled manufacturing skill, a capacity to produce whatever can contribute to either convenience or luxury, schools established in every village for teaching reading, writing, and arithmetic, the general practice of hospitality and charity amongst each other, and above all, a treatment of the female sex full of confidence, respect, and delicacy, are among the signs which denote a civilised people—then the Hindus are not inferior to the nations of Europe, and if civilisation is to become an article of trade between England and India, I am convinced that England will gain by the import cargo."

Under the reign of the King of Oudh, there was not one liquor

shop in all Lucknow; now, under the rule of Christian Government, there are more than a hundred. In the year 1890–1891 the English Government derived 4,947,780 rupees from the liquor traffic —a revenue three or four times larger than that derived either from customs or assessed taxes, or forests, or registrations, or Post Office, and seven times as large as telegraphs, eight times as large as from law and justice. The income is increasing every year by five hundred thousand dollars Fifteen years ago only ten per cent. of the people of India drank spirits, now over twenty per cent. To our rulers then, who represent to us political Christianity, money, howsoever obtained, is the highest Gospel, and certainly Christianity is responsible for all this because the first representatives of Christianity sanctioned the use of wine under the pretext of a religious ceremony. Drinking is, in fact, an inseparable feature of Christianity as understood by the low-class people who are perverted to Christianity. This is one of the vices which Christianity is forcing on us; and you will be startled when I tell you that even the missionaries have administered intoxicants to make conversion more easy and sure. Perversion always precedes conversion.

I make this statement not upon my own authority but on the authority of one of your own countrymen of high standing who has lived for years among missionaries in India and has been an eyewitness to such diabolical methods. And these men speak of the fatherhood of God and the brotherhood of man, the universal love and liberality of thought.

Even aside from these practices of the missionaries, the teachings propagated among the most ignorant of the low classes is at best a dogma of one or other particular sect.[1] Missionaries preach doctrines that they dare no longer teach in the public schools of this country. They expect us to permit our children to accept that

[1] Bishop Thoburn said in reply to this passage: "I am not aware that I teach or that others teach those poor creatures dogmas. My friend was brought up in India, but he hasn't lived quite as many years in it as I have; and I have been among those people. They don't know anything about dogma. We do not receive them into our schools to make them Christians. They come into our schools because their parents are converts. Nobody else in this world will ever give them this education unless we do."

which you would not allow to be taught to your own children. We cannot see the consistency of such a method. The American people spend thousands of dollars to propagate the doctrines of the fall of man, the creation of the world out of nothing in six days by a personal God, vicarious atonement, absolution from sin by the shedding of innocent blood. This is the Christianity offered to the poor and illiterate of India.

Christianity does not come alone ; nor does it come directly from Jesus Christ ; it comes to us through its modern representatives, who have introduced many vices into India, unknown to the Hindus. It has percolated through the layers of dogmatism and bigotry, of intolerance and superstition, of damnation and hell fire. It takes on itself the quality of these layers and imparts them to those that are received within its folds.

We in India, from the lowest pariah to the highest potentate, look upon life here as a mere waiting room from the known to the unknown, as a mere stage of growth from the lowest animalcule to the highest and perfected state. We believe in the eternity of the soul, meaning thereby that it is eternal at both ends—at the beginning as well as at the end ; we preach and practice brotherhood—not only of man but of all living beings—not on Sundays only but on all the days of the week. We believe in the law of universal justice—that our present condition is the result of our past actions and that we are not subjected to the freaks of an irresponsible governor, who is prosecutor and judge at the same time ; we depend for our salvation on our own acts and deeds and not on the sacrificial death of an attorney. Our rites and ceremonies may appear to you as mere superstitions but modern science is just beginning to understand that they are based on scientific principles.

My missionary friends say they are educating the people of India. I ask them with what object. It is only a bait offered for the purpose of catching the Hindu fish in the Christian net. Bishop Thoburn in his work on India honestly admits that stratagem had to be resorted to in order to attract children to the secular and Sunday schools ; and he mentions how successful the missionaries were in establishing a dozen Sunday schools in Lucknow in 1877, omitting,

however, to mention that before that time there was not one drinking-saloon in that city, while now there are more than a hundred. Bishop Thoburn is doing his best to make converts, but every convert he makes is transmuted from an industrious worker into an idle loafer, who becomes a burden on the missionary funds.

My brothers and sisters of America, there is not the least shadow of hope that India can ever be Christianised. After two hundred years of vain efforts and of spending millions of dollars with the prestige of the conqueror and backed by British bayonets, Christianity is not supported by the converts themselves. Every bit of Protestant Christianity in India is maintained partly by the money flowing from England and America, and partly by taxes imposed upon the Hindus against their will, which must be paid although the people starve.

The people of India as a whole are saturated with religious and philosophical thought. They think and ponder on spiritual matters from childhood to death. Even the street-sweeper is frequently more profoundly versed in subtle metaphysics and divine wisdom than the missionary sent to convert him.

* * *

Dr. Paul Carus said:

This is a truly interesting conflict, in which two men of different creeds are pitted against one another: the disputants, Mr. Gandhi, the Jain and so-called pagan, and the Right Rev. Mr. Thoburn, a Christian bishop, are the exponents of two incompatible world-conceptions. Their controversy is no mere tournament, but genuine war, and to those who understand the situation it is more exciting than a duel; for the battle is not between persons but between principles. Think only of the conflict back of it, which is more thrilling than a Mexican bull-fight, for there is more at stake than the worthless life of a bullying matadore. It is a struggle for life and death between two hostile religions; and every religion implies a peculiar civilisation, with its own moral ideals and methods of education, including all the possibilities of a higher development in a definite direction. The religion of a man is the core of his being, for it is the ultimate determinant of his actions. Mr. Gandhi

and Bishop Thoburn fight, not for sport, not for honor, not even for their lives, but for their souls.

How untrue is that sentence which Schiller puts into the mouth of Wallenstein :

> "Ideas live in happy peace together,
> While fiercely in space bodies collide."[1]

It is true enough that bodies do collide, but space is infinite, and there is room enough in it to accommodate all bodies in peaceful juxtaposition. Whenever a collision takes place, apparently other factors are active than material extension. Tables or chairs that stand in our way do not mind being pushed aside ; any other place will suit them just as well ; but ideas are not so obliging. No affirmation can remain at ease so long as its negation exists, and no infinity is large enough to harbor Yea and Nay at once. Thus we should rather say :

> "Bodies may dwell in happy peace together,
> While fiercely ideas wage their wars."

Ideas are, after all, the decisive factors in the great battle of life, and ideas are harder than stone or steel. They appear as fleeting ghosts without reality, and are, in the opinion of the materialist, unsubstantial humbugs. But a close inspection shows that these wonderful quiddities are the essence of existence. Ideas are the God who, through a long and painful process of evolution, becomes flesh in man, and reveals himself in the human soul. They reach their clearest expression in exact science and are as exclusive and intolerant as the old Jehovah who suffers no gods beside him.

I come as an umpire into this conflict, for I side with neither party. I am a man of science without a creed, repudiating on the one hand the very possibility of any special and extra-natural reve-

---

[1] Wallenstein says (Act II, Scene 2):

> "Leicht bei einander wohnen die Gedanken,
> Doch hart im Raume stossen sich die Sachen."

We need not add that Wallenstein, of course, is right when the word "ideas" means all possible and impossible fancies. The realm of imagination is infinite, and he can truly say :

> "Eng ist die Welt und das Gehirn ist weit."
> [The world is narrow, and the brain is broad.]

lation, and on the other hand always ready to accept what can be proved to be true, either through experimental demonstration or on the ground of soundly reasoned argument. But while I have no creed, I have a religion. My religion is a trust in truth. I propose to make truth the essence of our souls, meaning by truth the same as the scientist,—"a correct representation of facts"; and truth, as experience teaches us, must be established by our own exertions, after a careful examination and with rigorous criticism : it must be established by science.

By science I do not mean merely the dry formulas of the scientist, but the truth which they contain, and religion is the best knowledge of truth attainable, applied to moral conduct. Nothing more holy than truth ! Genuine religion is solidary with science, and a religion that scorns science is doomed. Science is the light on our path ; science is God's revelation ; and science alone, i. e., truth to be verified by science, is the saviour from whom we can expect help and comfort.

In entering the lists as a third party, I do not consider myself called upon to investigate the personal accusations and counter-accusations made to-night. They may be true or they may be false ; I do not care. No doubt mistakes are made by missionaries, and the so-called pagans are probably a little less ideal than Mr. Gandhi would make us believe. Missionaries, and Jains also, are mortals, like ourselves, and who among us is free from error and sin? What I care for are not the details but the principle of missionarising. I ask :

"Is a religious propaganda right or not? Is it presumptuous to intrude our religion on other people, or is it a sacred duty to do so?"

My opinion is in brief this, that missionarising is the inevitable outcome of a serious conviction. Truth is like a burning torch. It must shine, and you cannot hide it under a bushel. That religion is dead whose adherents have no desire to propagate their faith. He who would find fault with the principle of missionarising must foster indifferentism, which is not impartiality, but lack of conviction.

We cannot agree with Schopenhauer when he calls missions

"the acme of obtrusiveness, arrogance, and impertinence," but we are pleased with his proposition that Buddhists and Brahmans should be allowed to send as many missionaries of their own to Christian countries as Christians send missionaries to theirs.[1] And we do not doubt that the execution of this plan would be mutually beneficial. Missionaries from what we call pagan conntries would set us a-thinking. Their presence would be as suggestive and instructive as the World's Parliament of Religions. And if they did not convert us to their faith, they would most certainly help us to broaden our views and to attain a higher, a purer, and a truer conception of our own religion.

Competition may be inconvenient, but it is good, even in matters spiritual, for it promotes progress. Christians who denounce the Parliament of Religions prove only the littleness of their faith. There is something wrong in either the views or the policy of those who claim that their religion is too holy for comparison and criticism. It is the brass of glittering imitations only that haughtily denounces tests as improper, not the genuine gold of truth.

Many of Mr. Gandhi's propositions find a strong support among prominent men in Europe and America; missions to India and China are frequently spoken of as utter failures. Bishop Thoburn admits that "the Indian converts of the century now closing are regarded with a measure of contempt by many intelligent Indians and Europeans"; and Schopenhauer quotes a report that Brahmans, conscious of the superiority of their faith, have for the sermons of Christian missionaries only a smile of condescension or a shrug; and he adds:

"To pass over from the eternal Brahm which is present in all things, living in them, suffering in them, and seeking salvation in them, to the belief in a Maker out of nothing is too much for those people. They will never comprehend that the world and man have been fashioned out of naught."—*Par.* II, p. 240.

Bishop Thoburn has told us of his success among the outcasts, and we are deeply impressed with his kind-heartedness. According

---

[1] See Schopenhauer *Par.* II, p. 351 and p. 240, cf. also *W. a. W. u. V.* I, p. 421.

to his own statements he is more a philanthropist than a missionary. But granting all his statements, what is the cause of the failure of Christianity among the better classes of civilised nations?

There may be many local causes to prevent the spread of Christianity among the educated, but one applies universally. It is natural that the higher and more advanced a religion is the less accessible are its adherents to those Christian dogmas which are incompatible with science. So long as these dogmas are regarded as the essential element of Christianity, Christian missionaries cannot succeed. When Christian missionaries preach Christ's message of charity and love without the superadded dogmas of ecclesiasticism, they will succeed better.

But there is still another point of view. The value of missions must not be measured from the narrow standpoint of dogmatism. We must not seek their ultimate purpose in converts, but in the enhancement of truth by a propaganda of what we trust to be the truth. Missionaries may preach errors, but if they are only honest they cannot help promoting the cause of truth. The inhabitants of Asia have much to learn from us, and we can benefit them by making them acquainted with our civilisation. But the most important blessing which rests upon missionary work lies in this, that the better knowledge of those whom we contemptuously call pagans broadens our own Christianity, and makes us better Christians than we were before. Our criticism of the paganism in other religions suggests to us the necessity of sweeping before our own doors. Here is an instance of what I mean.

Mr. Spence Hardy, a Christian missionary to Ceylon, is very severe on Buddhism. He says in his book *The Theories and Legends of Buddhists*, dedicated to his converts:

> "What Buddha says about his past births and those of others is an imposition upon mankind."

Spence Hardy argues, If Buddha had lived in those ages of a remote past, he should have mentioned the existence of antediluvian creatures, and he goes so far as to speak of Buddha as "an impostor." Buddhist patriarchs are censured for representing the

earth as flat. Speaking of the miracles attributed to Buddha he says:

"I deny all that is said about the passing through the air of Buddha and his disciples, or of their being able to visit the Dewa and Brahma worlds."—P. 137.

"These things are too absurd to require serious refutation."—P. 140.

Granting that a belief in miracles is absurd, we ask, why does Mr. Hardy employ two measures? Jesus says: "With the same measure that ye mete withal it shall be measured to you again."

Mr. Spence Hardy forgets that Christ is in the same predicament with Buddha. Christ claims to have existed before Abraham, yet mentions neither the pterodactyl nor the mammoth. If Buddha's walking on the water is incredible, why is the same story of Christ to be accepted submissively and in blind faith? Buddha's ascent into the Brahma world is ridiculed, but when we read in the Gospel that Christ was carried up into heaven, we must believe, in spite of Copernicus; and as to the belief in the flatness of the earth, Mr. Spence Hardy had better kept his peace, for his converts are likely to hear, sooner or later, the story of Gallileo. There is scarcely any accusation in Spence Hardy's book which is not applicable to Christianity except one, that Buddha is arraigned, strange to say, for his "apparent candor and catholicity" which enable him to see much truth also in the views of his adversaries.

There is a class of Christians who use the acid of scientific critique for the decomposition of the errors of other people, and keep nothing for home consumption—where it is not less needed in the interest of developing that higher religion which would be free from superstitions and a blind submission to the letter.

If Christianity has any rival religion in the world it is Buddhism, the younger but more powerful sister of Jainism—the religion of our friend Gandhi. Exactly on those points concerning which the dogmatism of our churches comes into conflict with science, Buddhism agrees most closely with the theories of modern investigations now generally accepted by the scientific men of Christian countries. Buddhism recognises the rigidity of the law of causation in the moral world not less than in the physical world; it rejects the idea of a creation of the world out of nothing; it repudiates the an-

thropomorphism of the belief in an individual God, and in conformity with the doctrine of evolution, anticipates in all essential details the results of modern psychology as expounded by Ribot, Hering, Wundt, and other European and American scholars. Granted that Buddhism may not overcome Christianity, we cannot deny the fact that it has since the last four or five decades most powerfully affected Western thought. Its influence among us is still on the increase, and we can predict that it will contribute its share to a higher development of our religious views by teaching us a way of reconciling religion with science.

Now, to whom do we owe our knowledge of Buddhism? Mainly to such men as Samuel Beal and Spence Hardy, missionaries who for many years lived among Buddhists and translated their sacred scriptures. They were the pioneers in whose footsteps the more scholarly investigators, such as Weber, Roth, Deussen, Rhys Davids, Richard Garbe, Max Müller, and Oldenberg followed. The missionaries went out in the name of the church militant to destroy rival religions; but in the hands of a higher providence they became the very means of preserving them. They were the chief channels through which Buddhism reached Christian countries, and if Buddhists have been unable to send their missionaries to us, our missionaries did *their* work and can now help us to broaden our religion by the breadth of Buddhism.

Some time ago I met a thoughtful, white-haired lady, with enthusiastic spiritual conceptions, and I noted that her views were touched with a Buddhistic vein. Mentioning to her my observation, she told me that reviewers of her books had actually called her a Buddhist. She added: "And my good old father preached against Gautama!" The lady I refer to is Miss Abby A. Judson, daughter of Adoniram Judson, the first Christian missionary to the Burmese Empire, and translator of the Bible into Burmese.[1] Here is a straw

[1] It would not be correct to say that Miss Judson is a Buddhist, for she neither is nor calls herself a Buddhist. She states that she disagrees with Buddhism in so far as she does not believe in the doctrine of reincarnation. But this much I am authorised to say, that "the daughter of Adoniram Judson, the first missionary to Burmah, has found that the religion of Buddha is very superior to what is known

in the wind, which proves that missionary work is not lost. There is a deep truth in the Biblical saying: "Cast thy bread upon the waters, for thou shalt find it after many days."

Mr. Gandhi has attacked missionaries pretty severely, but he should remember that he himself was a delegate to the World's Parliament of Religions, and delegate is only another name for missionary. He came to this country as a missionary to represent Jainism, to dispel the wrong notions we may have of his religion, and certainly also, to make converts if he can. His work is missionary work, and we thank him for it. We are indebted to him, for we have learned from him and hope that he, too, has been able during his stay in this country to learn from us.

Missions have a broadening influence all around; they broaden the minds of those whom we wish to convert, and what is of still greater consequence to us, they broaden our own minds. But if we are in error, the truth will be attained in the end. Only beware of indifference. The God of Truth is not a partisan, but he respects the truth-loving even if it so happen that they defend errors. We read in the Revelation of St. John:

"I would thou wert cold or hot. So then because thou art lukewarm, and neither cold nor hot, I will spue thee out of my mouth."

Summing up, I say, promote missionary work of all honest convictions; preach the truth according to your best comprehension, in modesty, and with tact; not as a partisan who makes his own confession of faith the measure by which he judges other creeds, but as a disciple of Truth, just to his adversaries and always ready to learn, to grow, and to progress. The inevitable result will be a nearer approach to the common ideal of all religions, the religion of truth,—a religion which stands upon the firm ground of a scientifically sound world-conception.

---

as Christianity, especially the Pauline and the 'orthodox' phases of it; and that she thinks it unwise to try to engraft the Christian creed on Buddhistic nations, who would do better to return to the original pure teachings given by Buddha himself, and that she considers Buddhism as second only to the purest conception of modern spiritualism," which is the religious view which she holds.

DISCUSSIONS.

MIND NOT A STORAGE OF ENERGY.

IN REPLY TO MR. LESTER F. WARD.

ONE of the most difficult problems of modern philosophy is the formulation of the principles of Monism. Modern thought is pervaded by tendencies toward unity, but the question, "What constitutes a unitary world-conception?" has been answered in different ways by different philosophers, and their definitions are rarely compatible. As a striking instance we call attention to Mr. Lester F. Ward's philosophy, which, although sailing under the same flag, comes, in several important points, into conflict with the Monism of *The Monist*.

Mr. Lester F. Ward unquestionably agrees with us in starting from the principle of positivism, which implies that philosophy must be based upon the facts of experience. He is as radical in principle as we are, but he fails in carrying his radicalism to its last consequences. He aspires for the same goal and in the end we may come to terms if we learn to understand one another, but, so far, we regret to say that he has not as yet freed himself from the shackles of metaphysics. He has thrown overboard the metaphysics of spiritualism or idealism and of ontology, but remains deeply entangled in the metaphysics of materialism which hampers him all the more, as he is unconscious of it.

By metaphysics of materialism we understand a philosophy which reifies matter. Mr. Ward actually believes and maintains that "matter is the thing in itself," and that "its ultimate nature is not known." His argument is:

"Remove matter and there remains nothing to exert force or manifest properties. Dynamism is a form of magic.

"A relation is immaterial, but it can only exist between material things. Think away the latter and nothing remains."

When we think away material things, we do not think away immaterial things, such as energy and motion, forms and the laws of forms, feelings and thoughts. But Mr. Ward means that matter is an essential condition of all these things. Without raising the least objection to Mr. Ward's proposition in the sense in which he means it, we maintain that the same can be said about any other abstract idea or generalisation of a high order. Think away form, and nothing remains; for formless matter is as much a ghost as the matterless force of dynamism. Think away energy and what is matter without it? Think away sentiency and what becomes of the world-picture which constitutes our entire psychical being? Neither we nor anybody would know anything of the world and its problems. The world might exist as stolid matter moving about in space, but its existence would have no meaning, exactly as if it did not exist.

Mr. Ward has not as yet understood the truth that matter is as much an abstract as energy and motion, or as form. He understands that it is a mistake to reify abstracts, such as the faculties of the soul and the laws of nature, but he continues to reify the abstraction "matter." Matter denotes, not an unknown magnitude, not a metaphysical x, nor the substratum of phenomena, but a well known and clearly definable quality, abstracted by a process of generalisation from the facts of experience.[1]

How much akin Mr. Ward's materialistic metaphysicism is to the psychical metaphysicism of many spiritualists appears from the similarity of some of the modes of his thoughts. Mr. Ward says:

"Eliminate matter and a centre of force is a centre of relation with nothing to be related."

With the same logic the followers of such philosophers as Prof. T. H. Green of Oxford say: eliminate the subject, or ego-centre, and the soul is a centre of psychical relations with nothing to be related.

---

[1] For an explanation of "abstraction" see my *Primer of Philosophy*, pp. 118–127.

Matter is not the centre of existence and the possessor of all properties; it is not the substratum of reality; not the thing in itself: matter is one property among many other properties and has no preference before other features of existence. There is no transcendency, no absoluteness, about it.

If Mr. Ward were a little more radical than he is, he would soon find that he can no longer define mind as a property of matter, —as little as he can say that philosophy is a property of the printer's ink with which philosophical books are printed,—and that many conclusions of the monism of *The Monist* which appear to him as concessions to antiquated modes of thought in religion as well as in ethics are not retrogressive but progressive, for they do not revert to the errors of the past, but lead to a new and higher conception in which, however, all that is valuable and true in the old views is carefully preserved, while their superstitions are peremptorily discarded, and the essential is distinguished from the incidental.

It is true that we are more conservative than Mr. Ward, but our greater conservatism is actually due to a more radical radicalism in the theory of method.

The readers of *The Monist* will remember Mr. Ward's article "A Monistic Theory of Mind," (Vol. IV, No. 2, pp. 194–207) which found a brief reply in the editorial article "Monism and Henism" (pp. 232–236), in the same number. With reference to our controversy, Mr. Ward sent us his article on "The Natural Storage of Energy," which we publish in the present number; and he writes in the letter accompanying the manuscript:

"I have received so many letters from those who have read my article in the January *Monist* and my *Status of the Mind Problem*, asking me questions that require long answers, in which I can only restate what is said in this article, that I have decided to try to publish and send it as a general answer to all such questions. The thing that turned the scale and finally determined this action was a letter recently received from Prof. C. Lloyd Morgan, very courteous and appreciative, but propounding questions which it would require me to give him nearly all that is contained in this article in order fully to reply.

"The article also will serve as the only answer I can now make to your own strictures, and will be better than to put it in controversial form."

Mr. Ward's article contains only a few lines which attempt a

reply to our criticism, which, however, are neither convincing nor satisfactory. Mr. Ward seeks his explanation of mind in complexity. He identifies complexity and instability and is satisfied that greater motility implies that psychic property which may fittingly be called *awareness*. Mr. Ward says :

"It is safe to predict higher properties from higher degrees of aggregation. . . . To the complexity of protoplasm is due its motility which is that property which makes it alive, ... and bound up with this principle of life is this property of *awareness*."—*The Monist*, Vol. IV, pp. 198–199.

Complexity in my opinion, naturally results frequently in an increase of instability, but there are cases[1] in which very complex bodies are more stable than simpler substances. While I freely grant that upon the whole greater complexity will produce greater instability I cannot consider complexity as anything that ever so remotely implies an explanation of mind. If complexity, and with it instability, could explain the origin of feeling, a card house might be suspected of sentiency. Mr. Ward replies in the article of the present number that "the only complexity contemplated is organic complexity." But does he not see that by limiting complexity to organic[2] complexity he assumes what he intends to explain? Organised substance is only another name for protoplasm. What then do we gain by explaining the same thing under one name by referring it to the same thing under another name? What is the difference between "protoplasmic" and "organic" complexity? We have no objection to Mr. Ward's proposition that less active things may be superior to more active things, as (to use his own words) "a noisy person is often more important than a quiet one;" but this very proposition of Mr. Ward's is in our, not in his, favor, and should make him doubt his method of looking for an explanation of mind in complexity and instability, for there is no question that there may

[1] I quoted in the same number of *The Monist*, on page 234, an instance from Lothar Meyer, and have only to add that hexachloride and anoxygenised nitrates are not, as Mr. Ward seems to think, mere mixtures (see pages 258, 259), but chemical combinations.

[2] Here we follow Mr. Ward's usage of the term "organic." Otherwise we should say "organised." For a discrimination of the two terms see *The Soul of Man*, p. 48.

be substances in this world of higher complexity, greater activity, and more instability than protoplasm. Yet protoplasm is more important, and we repeat that the origin of feeling in protoplasm cannot be explained by the intricacy of its structure.

Mr. Ward seeks the explanation of the characteristic features of evolution in the realm of dynamics. He says:

"Every substance is a sort of battery capable of making effective the otherwise ineffective forces of its elements. . . . The power of substances to produce effects is great in proportion to the degree of organisation.

"The course of evolution has been toward the organised and efficacious through the process of storing energy in appropriate forms. It is the power of doing work that increases with organisation."

The essential feature of animal evolution has nothing to do with the process of storing energy.[1] But Mr. Ward seems to think that every science is but a branch of dynamics. He says in *The Psychic Factors of Civilisation*, page 91:

"All the sciences of the hierarchy deal with forces. . . . There is in all cases a dynamic agent determining the phenomena of every subdivision of knowledge which is entitled to be called a science. The sterility of the old psychology, so long known as metaphysics, was due to the fact that it was without any such dynamic agent."

Mr. Ward, fully conscious of the importance of sentiency, attempts to account for its origin. He says on page 252 of the present number:

"The explanation of the origin of sensibility is that protoplasm is of such an unstable and delicate nature that to secure its permanence it must possess some protecting quality, and sensibility is such a quality."

This, of course, is no explanation of the origin of sensibility, even when we grant that protoplasm could not secure permanence without it. We might as well say that the existence of pure spirit is explained (not demonstrated) by the idea of angels, as in order to produce angels nature would have to produce first pure spirit. It is obvious that nature is under no obligation to produce either protoplasm or angels. Mr. Ward has felt this objection, for he says:

"To some it may seem that this [proposition] makes it necessary to invoke design in order to endow it [protoplasm] with such a property, but the leading spirit

[1] For our view of the essential feature of evolution see "The Test of Progress," pp. 36–42, in *Homilies of Science*.

of modern biology obviates this. It teaches that protoplasm could not have come into existence at all without this property. If there had been no such property there would have been no protoplasm, no life, no organic world."

In addition to the futility of Mr. Ward's argument, we call his attention to the fact which, in this connexion, he has strangely overlooked, that there is a whole realm of protoplasmic or organised life devoid of sensibility. Nature secures the permanence of the protoplasm of the vegetal kingdom without sensibility. Plants attain even a very high degree of organisation, and the organisations of the highest plants are, aside (possibly, but not necessarily) from their molecular constitution, more complex than that of the lowest animals.

It is not our intention here either to present a detailed exposition of our own views or to repeat what we have stated in our article "Monism and Henism." Many points of minor interest in Mr. Ward's article to which we take exception, for instance the theory of pleasure and pain,[1] we are unwilling to discuss now, as we wish only in a general way to call Mr. Ward's and our readers' attention to the difference between his and our monism. We are satisfied to state that the problem of mind is the same as the problem of the development of meaning in sentiency, for the nature of mind consists in meaning or representativeness, and conclude with a few remarks on causation.[2]

It appears that our view of causation[3] differs from that of Mr. Ward. According to his view the cause of all lower activity is "the efficient cause, the *vis a tergo*" (present number of *The Monist*, page 253); to which we object that if chemicals which possess sufficient affinity to combine were indeed combined by a *vis a tergo*, by a force which pushes them together, and not by qualities inherent in them,

---

[1] Mr. Ward declares that "the supply of tissue is attended with pleasure," and "the destruction of tissue results in pain." Our view is set forth in *The Soul of Man*, pp. 338–345, and *The Ethical Problem*, pp. 70–71. We shall be much obliged to Mr. Ward for refuting our criticism of the traditional theory of pleasure and pain.

[2] For a detailed explanation of our view, see *The Soul of Man*, the chapter on 'The Origin of Mind," especially pp. 27–29, "How feelings acquire meaning."

[3] See our *Primer of Philosophy*, pp. 137 et seq., and compare *Fundamental Problems*, pp. 79 et seqq., 105 et seqq., and *passim*.

we are led to a strange dualism of inert material atoms that are pushed, and an outside force that is pushing them from behind. Our view of causation recognises the presence of spontaneity, a *vis insita*, a force or power within, in the very lowest stage of natural phenomena, and we have at the same time repeatedly called attention to the mistake of considering cause and effect as equal. According to Mr. Ward, the inequality of cause and effect develops by degrees. While in our opinion it is one of the most salient features of causation that cause and effect are *never* equal; otherwise there would be no change. Causation is transformation; it is the preservation of matter and energy in a change of form which takes place according to the laws of motion. The avalanche that buries a huge forest may have been caused by a slight fall of temperature in one little sunny spot of the snow. The inequality between cause and effect may be as enormous in the lowest stage of purely mechanical causation as in the highest stage of mental development. The essential difference between inorganic causation and purposive acts of living beings is not dynamical, but mental. The causative *raison d'être* of lower phenomena, such as gravity or affinity, are marked by an absence of representative feelings; while the causation of human activity possesses the adjustive faculty of representative feelings, or ideas, which determine the direction of the expenditure of energy and make purpose possible by a prognostication of the eventual results of certain actions. The meaning that resides in the sentiency of brain structures plays the rôle of chemical affinity in the realm of mind, and the meanings attached to the various modes of feeling, not any "increments of stored energy" which are "superadded at each evolutionary step," constitute the characteristic feature of mentality.

Mind, in our opinion, is not comparable to a storage-battery, but to a light. The dynamical aspect and an increase of energy, if there is any, are of no consequence in the consideration of mental progress. Mind does not accumulate more and more energies within, but by making feelings representative illumines the world round about, so that we can marshal its forces according to our needs.

EDITOR.

BOOK REVIEWS.

DIE RELIGION DES VEDA. By *Hermann Oldenberg*. Berlin: W. Hertz. 1894. Pages, 620.

At this time of wide-spread and popular interest in the religions of India, Prof. Hermann Oldenberg's comprehensive work on the Religion of the Veda, is highly opportune, for we have here a sober presentation of the Vedic world-conception. The author, well known for his excellent work on *Buddha, His Life, His Doctrine, His Order*, is one of those rare scholars who hold the mirror up to history, reflecting the distant past with the least possible addition of enthusiasm or prejudice. And it is a grand picture which he unrolls before our eyes, one of the most important pages of the history of mankind: the evolution of religion in its sacrificial and sacerdotal phase.

It goes without saying that Oldenberg's book will be indispensable to every one who is working in the field of Brahmanical lore, and in the interest of English readers it is to be hoped that an English translation will soon appear. At the same time we advise students to study Oldenberg's *Religion of the Veda* with constant reference to his translation of the *Hymns of the Rigveda*;[1] for the present work, the *Religion of the Veda*, rests upon Vedic hymns, which are the main and (aside from comparative references to the Zend Avesta and other sacred books) almost the sole source of our knowledge of the religion of the Vedic age. Oldenberg now presents us with what might be called the Isagogics into or a Handbook of the religious notions of the authors of the Veda concerning their gods and demons, and the magic efficacy of worship, of ritual, sacrifice, and prayer, explaining as far as possible their original meaning.

The study of Oldenberg's work will prove a help in two lines of inquiry, in Indology or Hinduism, and in anthropology. We now know that all people on earth travel in their evolution on the same path, they pass through the same phases o totemism, animism, and sacerdotalism to the purer religion of salvation from evi

[1] So far as we know the first volume only has appeared under the title *Die Hymnen des Rigveda*. metrische und textgeschichtliche Prolegomena. Wilhelm Hertz. Berlin. 1888. See also Max Müller's translation of the *Rig-veda-Sanhita*, and the literature on this subject in *The Sacred Books of the East*, especially Vol. XXIX, XXX, and XXXII.

by righteousness; and again from external deed-morality to the highest religious ideal of aspiring after purity of heart. The evolution of the religion of the Hindus is not an isolated but a typical instance of this, and it may be called "classical" because of the completeness of all the essential features which are here present and have been developed without the interference of disturbing influences. What the old Greeks are in art and science, the ancient Hindus have proved to be in religion and philosophy.

Oldenberg's book is divided into an introduction and four main parts.

The Introduction discusses the sources: (1) the Yajurveda containing the *Yajus*, i. e. magic formulas in prose, which are presumably very old, (2) the Atharvaveda, a collection of incantations and rituals; among the latter are marriage ceremonies and funeral hymns. The hymn to the earth is famous for its poetic beauty and psalm-like grandeur. (3) The more recent Vedic literature, as embodied in the Brāhmaṇas and Sutras, and other non-Vedic sources, especially such as are found in the Avesta and as are afforded by a comparative study of the Indo-Iranian and Indo-Germanic stage of religious life.

The first part is devoted to a general sketch of the Vedic gods and demons, setting forth, as it were, the logic of religious symbolism and mythology. It is strange that the Hindus, unlike the Greeks and the Teutons, did not develop a commonwealth of gods with one supreme ruler as their undisputed master and chief. No Odhin is among them, no Alfadur; no sovereign Zeus appears in the Vedic Olympus. There are indications of a development towards giving this place of honor to Indra, but Varuna with his divine majesty appears as his worthy peer, and the competition of these rival gods found expression in one of the songs of the Rigveda. (iv, 42).

Varuna says:

"Mine, indeed, is the kingdom to which all the immortals are subject. The "gods obey the will of Varuna. I rule supreme over the highest empire above the "cover of the heavens. I am King Varuna, and I am the first who owned the "magic power," etc.

Indra replies:

"Me, in the race, the men with proud horses invoke, me, in the battle, those "who are surrounded by enemies. Races I create, I, the liberal-minded; the dust "I raise, I, the greatly powerful. I have done all deeds. No one can oppose my "power, which is irresistible. When the soma-drink and the song of praise in-"toxicate me the infinite double empire of the airs trembles."

Professor Oldenberg proposes a new conception of Varuna. He doubts the identification of Varuna and Οὐρανός, heretofore considered as well established and prefers to regard Varuna as having originally been the god of the moon, so that Indra would preside over the world by day and Varuna by night. Without attempting to criticise Professor Oldenberg's arguments we must confess that we cannot accept them as convincing.

The second part of the book characterises the various deities. Agni, or the fire, is less personified than Indra, but plays perhaps a more important part in the religion of India, because the use of fire is so intimately connected with both the events of common life and all the various sacrificial ceremonies. Indra is the great hero of the gods. While the fire was constantly visible and thus facilitated an identification of the god and his element, the lightning appeared and disappeared, suddenly leaving a freer field to poetic imagination and naturally suggesting the personification of the thunderer. The seven Adityas who appear in close connexion with Varuna are, according to Oldenberg's plausible demonstration, of foreign origin, and personify the sun, the moon, and the five planets. Their mother, Aditi, is a later invention; her name and nature show a decided abstractness of conception, and she must be regarded as younger than her sons. The word "Aditi" means "unfetteredness," and the goddess with her seven children represents, first, the world-order, as it appears in the cosmic motions of the celestial bodies, and then the moral law of justice. Aditi and the Adityas are invoked for the redemption from sin. He who is tied down by guilt prays: "Redeem us out of the jaws of the wolves, O Adityas, as a fettered thief, O Aditi." The two Aśvins, the divine twins who ambulate in the early dawn together with Ushas (the Vedic Eos or Aurora), are the morning and evening stars. Rudra, from being called the Father of the Maruts, the deities of the wind, is generally supposed to be the god of the storm, but Oldenberg classes him as a demon of the woods, together with fauns and sylvans, of the cult of whom Mannhardt has given us a detailed exposition; Rudra is an embodiment of evil influences, which must be pacified rather than worshipped. Next in order are the lower deities (among them the Gandharvas and Apsaras, the former probably elves or spirits of the air, the latter nymphs or spirits of the water), evil demons and heroes.

We touch only lightly on the third part, "The Cult of the Gods," although of special interest, because it contains most of those subjects which, in their artificiality, are peculiarly Indian—the details of the sacrificial rituals, the Dîkshâ, Avabhritha, the soma-offering, etc. Sacrifices are not only, as, for instance, among the Israelites, for invocation, atonements, and giving thanks, but also for magic purposes; they are supposed to force and even to conquer the gods. The magic of the medicine-man, which we should expect to disappear at a higher stage of a belief in divine power, and of a purer religious worship, is carried to its last consequences and produces innumerable excrescences of superstitions and superstitious rites.

The fourth part ushers us into the realm of the soul, opening before us the vistas of heaven and hell, the mysterious intercession of the dead in the life of the living, the various funeral services, the burning of clothes and other property of the dead, the fate of the widow, and the mourning rituals. The soul (in the Vedas *asu*, and in the Upanishads *purusha*) is originally identified with the breath, while the mind, *manas*, is supposed to reside in the heart. In later periods the word

átman (breath, soul, self) replaces the term *asu*. *Asu* is the vital principle, of which every animal is possessed, while *manas* is the rational faculty of thought. The soul is described as a thumb-sized being of ethereal substance, who leaves the body in sleep and swoons, and quits it for good in death to ascend to the world of immortality in the heaven's firmament. The ruler in the empire of the blessed is Yama, Vivasvant's son, the first among the dead and king of all the deceased souls. In opposition to the heaven of the blessed stands the pit (*Kárta* or *padam gabhíram* = the deep place). Oldenberg rejects the theory of those who deny the existence of a hell in Indian mythology; he argues that the idea of conceiving immortality as a gift for good deeds, while evil-doers are annihilated, rests upon a misconception of the psychology of those ages, for a continuance of the soul's life after death was, according to the old traditions from savage times, a matter of course; and many passages of the Vedas confirm the belief in hell as unequivocally as that in a heaven. The souls of the dead are fed with libations and other offerings, and sometimes they reappear in animals, plants, or stars; they remain in relation to their surviving relatives, whom they afford blessings of all kinds and help in dangerous situations. The funeral rites exhibit many vestiges of more ancient beliefs, which are easily explained by parallelisms in the customs of savages.

That which characterises Hinduism in contradistinction to the Western nations is a softness and indifference, not to say weakness, which knows nothing of the moral worth of combative manliness. Almost all Hindus of higher culture, when speaking of the preferences of their nation, pride themselves on their peacefulness and represent themselves as possessed of a higher morality than their Western cousins. The truth is, that their lessened combativeness is not so much due to a heightened sense of justice as to a lack of strength. Says Oldenberg, on page 2:

"The separation of the Indians from the Iranians was for those who took the "step a renunciation, or, rather, the last definitive step towards a renunciation, of "all share in the great struggle of the races, in which the sound manfulness of the "Western nations was developed. In the luxurious stillness of their new homes "those Aryans, the brothers of the most distinguished nations of Europe, mingling "with the dark, primitive population of India, developed more and more the char-"acteristic traits of Hinduism; enervated by the climate, to which their type, shaped "in more temperate zones, was not able to adapt itself without heavy loss; ener-"vated not less by that lazy enjoyment which the rich country afforded them after "their easy victory over their unequal opponents, savages incapable of resistance, "and by a life which was totally lacking in great problems, in strength-giving suf-"ferings, and in the inevitable 'must.' The intellectual work done among these "people is poor in traces of that laborious struggling, of which alone it is the privi-"lege to exhaust the profundity of reality and to bring to fruition in mighty joyous-"ness the inner worlds of thought. With playful ease they grasped the surface of "things, with pictures whose luxuriant character flowed from the individual phan-"tasy, here graceful, there grotesquely intertwined, rich in colors, poor in firm,

"energetically drawn lines, now fusing into one another, now separating from one "another, ever and ever involving themselves in new forms."

We quote this passage at length, so that our Hindu friends may read it. There is much food for thought in it, and a proper recognition of the real state of things will greatly promote the progress of India.

The same conditions which gave to the Hindus leisure and wealth may at the same time have promoted the unparalleled supremacy of the priestly caste, of the artificialities of their rites and thoughts, their sportive play with enigmatic propositions, their love of the mysterious, and the unchecked speculative tendencies, which, on the one hand, produced the choicest and richest efflorescence of religious and philosophic ideas, but, on the other hand, left their theories unrelated to the facts of reality. If the Indian nation ceased to progress, if the younger civilisation of the West outgrew her in strength as well as in wisdom and exact science, we must seek the cause, not in incidental historical events, but in the lack of criticism and especially of that self-criticism, which has been forced upon the Western world by competition, by tribulation, and by struggle. The Indian nation, after the expulsion of Buddhism, returned to the old sacerdotalism of the Vedic age; they checked progress by the caste-system, and wear now their self-imposed fetters with an ill-disguised moral pride. But contact with the more powerful European civilisation is now rousing their energies from this lethargic sleep, and if the Hindus but allow themselves to be roused, they will gladly enter upon the path of progress that opens before them. Yet they should know that progress means struggle, and that they have to become strong and active, and that they have to be hardened on the anvil of reality. The Western nations owe much to India and to the thoughts of her ancient sages; the time has come when India in its turn can learn from the Western nations; and there is no question about what they have to learn: it is the method and exactness of scientific inquiry. The ultimate criterion of Truth is not *a priori* speculation, but experience; not subjective thought, but objective reality. κρς.

THE HIGHER CRITICS AND THE VERDICT OF THE MONUMENTS. By the *Rev. A. H. Sayce*, Queens College, Oxford Second Edition. Published under the direction of the Tract Committee. London: Society for Promoting Christian Knowledge. New York: E. and J. B. Young & Co. 1894.

The words of the author in his Preface are very likely to prove true. "I am well aware," he writes, "that the pages which follow will satisfy neither the 'higher critics' nor their extreme opponents." Certainly not the "higher critics." Fire is opened upon them in the second page in the recitation of what he calls "a typical example of the critical method." The "critics" refused to accept his and another scholar's reading of a word on "a small hæmatite weight," a word which the "critics" had referred to a late date. They did not examine the original, but trusted to a cast in which the word in question was not plainly reproduced. Such care, the author adds, "is not in accordance with 'the critical method.'" This denunciatory

judgment is followed by an "*ex hoc disce omnia!*" *With what judgment ye judge ye shall be judged.* Throughout Mr. Sayce's book frequent references are made to the now famous Tell-el-Amarna Tablets (on which the first real light was thrown by Erman and Winckler of Berlin). In *The Academy*, April 7, 1888, p. 246, Professor Sayce writes: "Most of the tablets contain copies of despatches *sent to the* "*Babylonian king by his officers in Upper Egypt*, and as one of them *speaks of the* "*conquest of Amasis* (Kasad Amasi), while another *seems to mention the name of* "*Apries*, the king in question must have been Nebuchadnezzar. *The conquest of* "*Egypt by Nebuchadnezzar*, so long doubted, *now, therefore, becomes a fact in his-* "*tory.*" (Italics mine.) Not one of these statements, as is now known, is correct. They were all very important statements but one discovers no interrogation marks suggestive of uncertainty.

I will not stop to note other grievous errors in the way of translation from the author's work, which, however, might be done with ease. Not to go outside of this book he translates *uritsu*, "offspring," (p. 185, note) and finds in this monumental support for the sacrifice of children among the Babylonians. The reasoning on which this translation is based does not hold in the science of lexicology. Shall we then add "*ex*" his "*disce omnia*!" and thereby intentionally convey the impression that all the work of Professor Sayce is nullified or vitiated by equally bad blunders? To do so would be eminently unjust to him, and would, I suspect, suggest the *cacoethes carpendi*.

Since these words were written by the author, Robertson Smith *has* taken pains to examine the weight itself (see *Academy*, November 18, 1893) and suggests, in view of the difference in the writing contained on the two sides, that *shel* is an abbreviation for *shalem*—a view quite different from that entertained by Professor Sayce. Were it clearly proved that the "critics" were in error in one or more cases (as they often have been) this would hardly suffice to throw discredit upon their work as a whole. The impression is apt to be made that the "critics" proceed on the assumption "that before the Babylonian captivity writing was an art rarely, if ever, practised." What proportion of his "religious public," for whom he writes, knows of Havet and Verne of whom this is said to be true? How many of the representative "critics" of to-day are unacquainted with the results of archæological research? The fact is, the author has taken no pains either to distinguish between the different schools of "critics" or to point out that for more than a quarter of a century, since the time of Graf, the necessity of calling in the aid of archæology has been fully admitted by the "critics" themselves, and not only admitted but absorbed by "critics" like Delitzsch, Dillmann, Cheyne, and others. It savors somewhat of the unscientific and uncritical method to sweep in all critics from the days of Simon and Astruc down to the latest analyst,—men who knew nothing of modern archæological achievements,—men who for a time were sceptical of the archæological conclusions in the period when Assyriology was in its infancy, and men who to-day joyfully accept all that is indubitably proven, and then by the indiscriminate use of

the words "critics," "theories," "assumptions," attempt to bring their work into disrepute. Nowhere in his book does he refer to the "critics" or "critic" (with one or two exceptions) whose theory and conclusions he rejects. Neither does he distinguish between the "higher criticism," in the strict sense, and "historical criticism."

The "higher critics" have just cause for not being "pleased" with the vague denunciations and indiscriminate treatment accorded to them in this work. But how does the case actually stand when we come to look at the real bearing of these discussions upon the conclusions of the critics? Notwithstanding the fact that the author's preface prepares the reader to look for the complete rout of the "critics" he finds that the "critic" has been working his way through this maze of literature with almost the certainty of instinct. And for this reason the "extreme opponents" of the "critics" will look upon the work with dissatisfaction. The book puts in evidence the undeniable testimony of the monuments and the accepted traditional views bow themselves out of this superior court from which there is no appeal.

Let me now indicate how far the conclusions of the critics are justified by the verdict of the monuments as Professor Sayce reads it. In the first place, it is to be remarked that Professor Sayce occupies virtually the same standpoint as the critics. "As long," he writes (p. 26), "as our researches are historical and archæolo-"gical the Scriptures of the Old Testament must be for us merely a fragment of "that ancient Oriental literature, other fragments of which are being exhumed from "the mounds of Egypt, of Assyria, or of Babylonia. They are historical documents "which must be examined according to the same method and upon the same prin-"ciples as other documents which claim to be historical. We must not apply to "them a different measure from that which we should apply to the Chronicles of "Froissart or the histories of Herodotus . . . . the Biblical records have been put "into a category by themselves to their infinite harm and abuse." Again (p. 3), "A critical examination of a narrative will also help us to discover whether the document which embodies it is of a simple or a composite nature." But this is what the opponents of criticism deny. They often assert that any literary product may be resolved by the critical method into two or more apparently different documents. Professor Sayce continues: "Modern research has shown that a considerable part "of the most ancient literature of all nations was of composite origin more espe-"cially where it was of a historical or religious character. . . . The most ancient "books that have come down to us are, with few exceptions, essentially compilations." These statements are also denied by the traditionalists.

It will thus be clear, even to the general reader, that while Professor Sayce is of the opinion that the critics have not given due regard to archæology, and though he states his judgments of the "popes who proclaim their doctrine of infallibility" in a needlessly offensive way, in his principles he does not differ from them. He admits that the archæologist and the "critic" are agreed in investigating the Scriptures as historians and not as theologians. The Old Testament must be treated as

a fragment of ancient Oriental literature. Neither is concerned with its inspiration.[1] Nor are archæology and criticism irreconcilable foes. "On the contrary," the "learning and acumen" of the critics "have not been altogether in vain." "Much has been established by them, which the progress of Oriental research tends more and more to confirm." "The judgment the 'critic' has passed on the so-called historical chapters of the Book of Daniel has been abundantly verified by the recent discoveries of archæology." These are concessions hard to be reconciled with the frequent denunciations of the "critic" which too often mar the pleasure of reading this valuable book—the best product, I may venture to state, of Professor Sayce's "Protean" scholarship.

Now let us examine the Verdict. At the close of the book the author writes: "The apologist may lose something, but the 'higher critic' loses much more." The reader must judge for himself.

If we refer to one of the latest and best works of the "critics"—*Introduction to the Literature of the Old Testament*, Driver. We read, p. 18 et seq,, "The pro-"cess by which, probably, the book of Genesis assumed its present form may be "represented as follows: First, the two independent, but parallel, narratives, of "the patriarchal age, J. and E., were combined into a whole by a compiler. . . . "The whole thus formed (JE.) was afterwards combined with the narration and by "a second compiler, who, adopting P. as his framework, accommodated JE. to it, "omitting in either what was necessary to avoid needless repetition, and making "such slight redactional adjustments as the unity of his work required." And Professor Sayce writes, Chapter II, 8, as follows: "One of the most assured results of the "literary analysis of the Old Testament records has been the existence of documents "of different age and authorship in the Pentateuch. . . . The literary foundation upon "which the history and religion of Israel rested is, in its present form, a composite "work. The fact is fully in accordance with the teachings of Oriental archæology." A parallel is then drawn between this material of the Pentateuch and the so-called Book of the Dead in the literature of Egypt and the religious hymns and ritual of Babylonia. The history of the Book of the Dead reaches "from the days of the pyramid-builders down to the age of the Persian conquest of Egypt." "New chapters were embedded in it, old chapters were modified, glosses and glosses upon glosses were added." "The 'higher' criticism of the Old Testament has thus been justified in its literary analysis of the Books of Moses" (p. 34). Professor Sayce, however, has no sooner acknowledged what a profound knowledge of ancient Oriental literature compels than he proceeds to minimise the value of the critics' work by asserting that the critic has started with a conviction of the modernness of the application of writing to literature, in the true sense of the word, prior to the age of Solon. The fact is, this has had little to do with critical theories.

---

[1] Cf. Driver, *Introd.*, p. xi. "The conclusions affect not the fact of revelation, but only its form."

In 1521, Carlstadt was led, through the account of Moses's death being given in Deuteronomy, to put forth his thesis: "*Defendi potest, Mosen non fuisse scriptorem quinque librorum.*" La Peyrère in his *Systema Theologicum ex Preadamitarum Hypothesi* (1655) declared that Moses had kept a written diary. Spinoza, 1670, who thought Ezra might have compiled it from different histories, was influenced wholly from the literary side. Simon, 1678, believed that Moses wrote the laws. Astruc, 1753, discovered that the names of *Elohim* and *Yahweh* interchange throughout Genesis and made the documents in which they occur *les memoires originaux* which Moses used in the composition of Genesis. Ilgen, 1838, believed that the sources of the Pentateuch were certain records that had been preserved in the temple-archives of Jerusalem, and which had been compiled by three different authors. In 1831, Hartmann denied that Moses had participated in the production of the Pentateuch. The Hebrews, he taught, had learned the art of writing in the time of Samuel. In 1838, Kurtz referred Deuteronomy to Moses. So also Schultz, who referred the main source of Genesis to primitive tradition, which had been written down prior to the exodus. Nor have later critics been misled by this assumption. What reasons does Cheyne assign for rejecting the Jewish tradition which attributes the authorship of Ecclesiastes to Solomon? This is what he says: "Whichever "way we look, whether to the social picture, or to the language, or to the ideas "of the book, its recent origin forces itself upon us" (*Job and Solomon*, p. 225). Riehm (*Einleitung in das A. T.*, p. 53) says distinctly that "the Semitic people had an alphabetic writing in pre-mosaic times." Professor Sayce writes (p. 60 "the "'higher critic' may be right in holding that the historical books . . . are compila- "tions of a comparatively late date, but he is no longer justified in denying that the "materials they embody may be contemporaneous with the events recorded in "them." And Cornill, a disciple of Wellhausen, said before this (*Einleitung*, p. 14) that we cannot deny a knowledge of writing to Moses. The reasons for assigning the Pentateuch in its present shape to a late date are derived from the study of the history and literature itself. The requirements of the Pentateuch were unheeded, say the critics, from the time of Moses to Ezra, even by the most zealous reformers Men like Samuel, David, and Isaiah, had they known it, could not have so completely ignored it. The sacrifices enjoined and ritual prescribed were inveighed against by the prophets, they claim, in such a way as to preclude a knowledge on their part of Mosaic legislation.

The interesting facts adduced in Chapter II in support of the antiquity of Oriental literature do not, therefore, affect the critical conclusions which assign the Pentateuch to a late date.

Chapter III, which deals with the Babylonian element in Genesis, shows how the latter is dependent upon the former. "The resemblances between the two "accounts of creation are too great to be purely accidental. They extend even to "words." The *rêshîth* "beginning" of Genesis i, 1, corresponds to the *ristu* of the Assyrian story of creation. The Hebrew word *tehom* (deep) is the Assyrian *tihamtu*.

The Sabbath-rest was a Babylonian institution, and the word Sabbath of Babylonian origin (*Sabbatu*). The Tell-el-Amarna tablets prove that Babylonian influence and literature were strongly felt in Canaan before its conquest by the Israelites.

Professor Sayce rejects (as the writer has done for the past eight years) the explanation of *Elohim* (God) as a *plur. majestaticus*, etc. The Tell-el-Armana tablets now show that a similar use of *ilâni* prevailed in the Babylonian language. The presence of the word in Genesis, however, proves nothing as to the date of the document as it occurs throughout Hebrew literature.

When we come to the account of the flood, Professor Sayce says (p 115): The resemblances between the Babylonian and Scriptural accounts are so obvious that instead of dwelling upon them he will point out "only the differences." He accepts the analysis of the flood story into a Jehovistic and Elohistic (p. 116) and states (p. 117) that in Babylonia there were also "several versions of the story." Both stories he refers to the same Babylonian source (*So. Del. Par.*, p. 94), suggesting that the writers of the Tell-el-Amarna tablets may have been acquainted with the Chaldean Epic in which the episode of the flood occurs The deluge-story may have been introduced into the West before the age of Moses, and the similarity between the Biblical and Babylonian accounts does not therefore indicate a borrowing from the latter during the exile. This opinion is contrary to that previously held both by some Assyriologists (Delitzsch, Schrader) and by some critics (Kuenen). But it is in full accord with Dillmann (Genesis vi, 9 et seq.) who says: "If the cuneiform "narrative of the deluge-story actually found its way to the Israelites during the "period of the Kings there was no reason why they should accept it, unless some "information about a flood had been current among them."

On the much discussed Chapter X of Genesis Professor Sayce has outdone the critics. This, too, is the place *par excellence* on which archæology has flashed its light. The evidence bearing upon this chapter is summed up (p. 152) as follows: "The episode relating to Nimrod forms . . . a part of the Babylonian element . . . "*it is foreign to the original plan of the tenth chapter.*" The subject-matter may have been derived from documents older than the age of Moses, but the "main part of the chapter" brings us down to the period when the Kimmerians appeared in Western Asia and the Lydians served in the armies of Egypt—*the period of Ezekiel.* Usually the critics are content to refer only the Elohistic portion of this chapter to a late date. (See Bacon, *Genesis of Genesis.*)

In discussing the fourteenth chapter of Genesis, Professor Sayce brings out very clearly the value of recent discoveries in Assyriology. He makes it appear quite probable that the history contained in the chapter is drawn from cuneiform sources, but when he says (p. 161) that "the campaign of Chedorlaomer and his allies has *been proved to be historical*," he states as fact what, at best, is only an inference.

In omitting to state that the credibility of this narrative had been upheld by the "higher critics," Ewald, Delitzsch, and especially Dillmann, he does injustice

to himself and the "critics." Kuenen, Nöldeke, and others denied it. But Dillmann, *Gen.* 1886, pp. 231 et seq., also 1882, pp. 218 et seq., argues at length not only for its historical character, but also for the possibility of its having been excerpted from a foreign document. Ewald argued from the designation of Abram in verse 13 as "*the Hebrew*" that the narrative was drawn from a foreign source. Professor Sayce seems to be unconsciously influenced throughout by the fact that he is writing for the Religious Tract Society. The balance is constantly being struck in favor of the traditionalist. On page 172 he says "the net result," while it justifies the belief that Genesis "is a compilation, it only partially justifies the theory as to the nature of that compilation." Which theory? "Nimrod is a historical personage, and the historical character of Chedorlaomer's campaign has been amply vindicated." All that the facts adduced by Professor Sayce, or afforded by Assyriological research up to date, warrant us in saying of Nimrod or of Chedorlaomer's campaign falls short of these pretended apodictic statements.

Chapter IV deals with the Canaanitish and Egyptian elements in Genesis. It is an overstatement of the facts to speak (p. 177) of "the vindication of the historical character of Melchizedek." The Tell-el-Armana tablets afford us information which strengthens the view held by such "critics" as Delitzsch, Dillmann, Diestel, that the facts of the record are historical. Professor Sayce has brought together in this chapter much information, not always fresh, however, but valuable and militating in no way against the critical analysis. On page 231 it is said that we may yet find "below the documents which criticism claims to have discovered there is an "earlier stratum of literature which in its origin is partly Babylonian, partly Egyp-"tian, partly Aramaic, partly Edomite, and partly Canaanitish."

Throughout, Professor Sayce, while apparently disputing the conclusions of the critics, is in reality in much closer accord with them than he seems to suspect. Referring (p. 309) to Joshua, chapter xi, he says that the conquest of Jabin of Hazor is "inconsistent with what we are told in the Book of Judges, and it would there-"fore seem that a conquest is ascribed to Joshua which really happened at a later "date." "The chronology in the second Book of Kings is more than forty years "in excess." In the face of Joshua x, 40-43, he says (p. 359) that "the common "belief that the Canaanites were exterminated before the children of Israel is not "supported by the statements of the Old Testament writers." This statement in Joshua may be incorrect and out of accord with "archæology and philology" and with II Samuel xv, 18, 19, and vi, 10, and with other passages in Joshua, but it is quite explicit: "He left none remaining," Page 373 Mesha (the Moabite) "ascribes his victories to Chemosh just as the victories of Israel were ascribed to Jahweh." The history and documents of Israel cannot be separated from those of surrounding nations and judged by a different standard (p. 375). "The assertion of the Biblical writer that Mesha did not rebel until after Ahab was dead cannot be strictly correct" (p. 370). We must not look for "a colorless narrative" from the Jewish historian. He wrote "to celebrate victories," not disasters. Neither must

we expect "strict accuracy of language," nor the "critical judgment of a Gibbon or Grote" (p. 372).

Professor Sayce shares the judgment of the critics on the author of Chronicles. Like the "commentators down to the time when the Assyrian inscriptions were discovered" he drew "erroneous inferences" from what he "had read in the book of Kings," thus making Pul and Tiglath-Pileser two distinct persons, when Pul was only another name for the Assyrian king "The Chronicler displays that partiality "for large numbers which is still characteristic of the Oriental." Here we find the beginnings of the Jewish Haggadah. The Book of Jonah "belongs to a later period than the age of the prophet Jonah, the son of Amittai" (p. 487). Esther belongs "to the Jewish Haggadah" (moral romances). With reference to the Book of Daniel contemporaneous evidence shows that Belshazzar "never became king"; neither was he the son of Nebuchadnezzar, "as we are repeatedly told in the fifth chapter of Daniel" He was the son of Nabonidus, who was a usurper and without connexion with the family of Nebuchadnezzar. "Darius, the Mede," is a reflexion into the past of Darius Hystaspes. Many points are urged in support of a *late* date. The author was unacquainted with the language of Babylonia and lived "at a period later than Alexander the Great."

Such is the verdict, and its almost complete accord with "critical" results makes it all the more to be deplored that Professor Sayce "has treated," to use his own phrase, the "critics" with such "scant courtesy." It is to be regretted that he did not discriminate between the "critics" and tell his readers to whose views the conclusions he draws from the monumental records are opposed. It is most of all to be regretted that the impression should be made upon those who are not acquainted with the history of criticism, and with the conclusions accepted by the more moderate critics, that the traditional views have been confirmed and the "critics" buried with the same spade. Professor Sayce does not say so, but unfortunately the inference is drawn, hence a reputed scholar, who has read the "Verdict," not long since proclaimed to his audience that the "Scriptures are accurate, even in the details." This, too, in a University town!

JAMES A. CRAIG.

UNIVERSITY OF MICHIGAN.

THE DAWN OF ASTRONOMY. A Study of the Temple-Worship and Mythology of the Ancient Egyptians. By *J. Norman Lockyer, F. R. S.*, etc., etc. New York and London: Macmillan & Co. 1894. Pages 432.

Most of the recent progress in astronomy is due to the aid which it has received from other sciences; and this debt, which Professor Lockyer acknowledges in his preface, he has undertaken in the present work to in part repay to the benefit of the science of religions.

His excursion into this unaccustomed field was first suggested by the peculiar placing of the Parthenon and the many changes of direction in the successive re-

buildings of the temple at Eleusis, as revealed by the French excavations. These circumstances attracted his attention while making a casual examination of the ruins in the company of a friend during a holiday tour of the Levant.

Recalling the fact that in England the eastern windows of properly constructed churches are supposed to face the place of sun-rise on the feast-day of the saint to which they are dedicated, he made a careful note of the orientation of the foundations in question. After his return he endeavored to ascertain whether the subject had ever been worked up, but could then learn of nothing except in regard to the Christian churches of England and Germany.

On account of the presumable dependence of the Eleusinian temple-building upon ideas of Egyptian origin, he examined the data regarding the orientation of Egyptian temples collected by the French in 1789 and the Germans in 1844. He soon became convinced that astronomical considerations had determined the manner of their construction, and in a course of lectures delivered at the School of Mines in 1890 (published in *Nature*, April–July, 1891) he pointed out the probable utility of a study of the exact bearings of the religious edifices of Egypt in the light of astronomical facts as a means of ascertaining the exact dates of their foundation and of obtaining a fuller knowledge of the origin and significance of the Egyptian mythology.

Shortly afterwards he proceeded to Egypt to make some inquiries and investigations on the spot, for the purpose of verifying and correcting the published orientations, and gathering connected data important to a determination of their true astronomical and religious significance. The work before us is chiefly based upon the notes made during this trip, from which he returned in March, 1891, in connexion with the great official reports of 1798 and 1844 (Napoleon and Lepsius), and a series of papers on the orientation of ancient temples previously published by Professor Nissen, of Germany (in the *Rheinisches Museum für Philologie*, 1885), which Professor Lockyer did not see until after his investigations in Egypt had been made.

The author has availed himself freely of the personal assistance of Professors Maspero, Krall, and Müller in the general work, and of Sayce and Jansen in his comparative studies in Babylonian astro-mythology. He very modestly disclaims any pretentions to being considered an Egyptologist, and publishes this book as a suggestion and guide to future work rather than as a summary of definite results. Final conclusions, he says, can only be reached after a great deal of very patient and laborious special work has been done, both on the astronomical and archæological sides, directed towards the collection of a far more full, exact, and reliable series of data than is now in existence.

The most important part of this work is a re-survey of the temple sites, with modern instruments and methods. Then the astronomers must prepare tables of the rising and setting conditions of the stars for a period extending to at least seven thousand years before Christ. The table published by the German Astronomical

Society, which is the best thus far available, goes back only to 2000 B. C., and does not include the southern stars. In the meantime, the Egyptologists must arrange tables of synonyms, showing the local names of mythological personages, and the animals, or tribal totems, with which they are severally identified in different parts of the country. "After this work has been done," he says, "it will be possible to begin to answer some of the questions which I have only ventured to raise."

Professor Lockyer enters upon his subject by a few general remarks regarding the astronomical and astro-mythological data yielded by the surviving records of ancient civilisations.

The first civilisation so far traced was in the Nile valley and adjacent countries of Western Asia. In Egypt we can go back six or seven thousand years, in Babylonia over five thousand (but with evidence that eclipses and other astronomical phenomena had been observed there for some thousands of years before that time), and in China and India, where monumental remains are lacking, and we have to depend upon traditional evidence, at least four thousand.

An examination of the texts, on stone, or brick, or papyrus, or paper, which record the thought of this remote antiquity, shows that the observation of the heavenly bodies has passed through three distinct stages, the first characterised by a feeling of wonder and worship, the second by a desire for immediate practical advantage and for secret information as to the present or future affairs of men (astrology), and the third by a love of knowledge for its own sake.

The last phase, which seems to have been reached in Egypt and Chaldea before 300 B. C., now prevails in civilised countries; and this scientific interest is practically the only one which astronomy has for us moderns. But for thousands of years before the scientific profession had arisen the phenomena of the heavens were carefully studied and recorded in the religious, agricultural, and astrological interests. So closely was this study bound up with religion in the earliest times that in ancient Babylon the sign for "god" was a star, and a group of three stars is one of the Egyptian hieroglyphs for the plural "gods." Oddly enough the worship stage of astronomical research is entirely missing from the annals of the ancient Chinese, the utilitarian motive having apparently dominated there from the first. In India, of whose early mythology we have a very full record in the Vedas, the sun and the dawn, the over-arching heavens, the earth, and the fire, and the waters, and the storm-clouds, were the deities first adored.

In Egypt we find a similar state of affairs. The sun and the dawn were the chief objects of worship from the very earliest times, and everything connected with the sunrise and the sunset was worshipped Under countless names the same diurnal or perennial phenomenon was recognised and venerated. The rising or Child Sun was the hawk-headed Harpocrates, Hor, Horus, or Chepera; the sun of noon was Râ, the evening sun Tum or Atmu, and the sun already set Osiris. Amen-Râ probably signified the sun at the summer solstice, and Sebak-Râ (with the crocodile head) and Chnemu-Râ (with the ram's head) possibly had reference to other spe-

cial seasons of the year, while Min-Râ signified the everlasting and vivifying solar energy.

Antithetical to the sun was a god of darkness variously known as Sit, Set, Sut, Anubis, Typhon, and Bes, and by countless other appellations. Anubis is represented as a jackal, and the goddess Taur-t, the feminine counterpart of Typhon, is represented as a hippopotamus.

Besides the sun-gods and the gods of darkness there are two moon gods, Thoth and Chons, and a goddess of the stars or of the starry heavens called Sesheta.

A large number of divinities are associated with the phenomena of dawn and twilight. Isis represents both dawn and twilight, but especially the sunrise; Nephthys represents both, but especially the sunset. Shu is also the dawn, or the sunlight in general or the air, and Tefnut represents the colored rays at dawn. Shu and Tefnut are called the Eyes of Horus. Neshem is the green-tinted dawn, and Sechet is the fiery dawn.

The sky is Nu or Nu-t, and with it Hathor, the female power of Nature, is sometimes identified. Seb is the earth. Chnemu, the Moulder, is connected with Râ; and Ptah, the Opener, often appears as a form of Osiris.

The under-world, Amenti, the abode of the dead, was the place below the Western horizon where the stars which died on the horizon lived until their rebirth in the East on the morrow.

Much attention was paid to the fixed stars from the earliest times of which we have any knowledge. One of the chief duties of the sacrificial priests was to watch for the stars which heralded the dawn, and thus gave warning when to prepare for the sacrifices which were offered at daybreak. These morning-watchers soon acquired a knowledge of star-places and compiled lists of decans, or belts of stars the rising of which followed each other by ten days or so. "These are the exact equivalents of the moon stations which the Indo-Europeans and other peoples invented for the same purpose." Moreover, the daily risings of the chief stars were observed very carefully throughout the year.

These facts have long been known; but the important circumstance that the placing of the temples was determined by astronomical considerations has hitherto escaped attention. It has been customary to accept the statement of Vitruvius that the temples were built simply to face the Nile. Archæologists who had personally investigated the matter, however, found that their arrangement was principally characterised by the want of it, as they faced in all directions, apparently without any system or order whatever. Their natural conclusion was that the Egyptians had a sort of symmetrophobia, mitigated perhaps by a general desire that the temple should face the Nile. But when the orientations are carefully studied (due allowance being made for the magnetic variation) with reference to the dates of their erection so far as known, it is found that their axes were always directed towards some celestial body at its rising or setting on some day of critical interest either from the astronomical, agricultural, or religious point of view.

Every temple was so built that its central axis was open and commanded a view of the horizon. Usually it had a large number of halls, corridors, porticos, and approaches, but the doors were so cut and the spaces so arranged that there should be no obstruction along that medial line. The opening on the outside was quite broad, and each succeeding partition narrowed it somewhat until in the Holy of Holies only a very narrow entrance remained, but always exactly opposite the centre of the outer opening often more than five hundred yards away. This arrangement was determined by the same principle which governs the construction of the telescope. "They wanted to keep the light pure and to lead it into their sanctuary "as we lead it to the eye-piece. To keep the light that passes into the eye-piece of "the modern telescope pure, we have between the object-glass and the eye-piece a "series of what are called diaphragms; that is, a series of rings right along the "tube, the inner diameter of the rings being greatest close to the object-glass and "smallest close to the eye-piece; these diaphragms must so be made that all the "light from the object-glass shall fall upon the eye-piece, without loss or reflexion "by the tube.

"These apertures in the pylons and separating walls of the Egyptian temples "exactly represent the diaphragms in the modern telescope" (p. 108).

Through this horizontal telescope formed by the temple axis the first rays of the sun or star at its rising, or the last rays at its setting, would flash for a few minutes into the darkened sanctuary at a certain time in the year, thus furnishing data for exact astronomical calculations, and at the same time forming a most impressive culmination to the festal rites with which the occasion was celebrated.

A classification of the temples according to their orientations separates them into several groups according as they are oriented (1) towards the rising or setting of the sun at the summer or winter solstice, (2) towards the rising or setting of the sun at the equinoxes; (3) towards the rising or setting of the stars in the northern heavens; (4) towards the rising or setting of stars in the southern heavens.

The chief stars thus far ascertained to have special temples are the southern stars Sirius, Phact (α Columbae), α Centauri, and Canopus (α Argus); and the northern stars Dubhe (α Ursae Majoris), γ Draconis, Capella, and Spica. Seven temples built between the years 3150 and 700 B. C. have been identified as directed towards the rising of Sirius at the summer solstice. Phact, which preceded Sirius as a warning star for sunrise at the summer solstice, has twelve temples, erected between 3700 and 900 B. C. Nine temples, built between 3700 and 2450 B. C., are connected with α Centauri, which then heralded the sunrise at the autumnal equinox. Dubhe has three known temples (5200-4200 B. C.), and γ Draconis which, after Dubhe became circumpolar and ceased to rise and set, succeeded it as the representative of the northern stars, and which announced the sun at the autumnal equinox a thousand years before α Centauri, seven temples (4600 to 1200 B. C.).

To Canopus, which at first set just after the sun at the autumnal equinox, are credited eight temples (6400 300 B. C.). The temples directed toward Capella and

Spica were not associated with equinoxes or solstices, but nevertheless, as in the other cases, they admitted the light of those stars on days when they rose or set with the sun. Capella had five temples, built between 5350 and 1750, and Spica two temples, built about 3200 and 1900 B. C. respectively. Antares (α Scorpii) rose heliacally at the autumnal equinox, and Aldebaran and the Pleiades at the vernal equinox, when some of the equinoctial temples were built, and were doubtless observed and venerated in them. Besides the stars thus far named, Arcturus, α Leonis, α Phenicis, β Muscae, α Trianguli, α Pavonis, Altair, and β Argus are suggested as having probably received attention as the patronal stars of temples, on account of the positions which they occupied in relation to the solstitial or equinoctial sun during some part of the temple-building period; and Vega is supposed to have preceded Dubhe as the representative of the northern stars.

Temples could only be oriented towards the stars which rise and set; but the circumpolar stars which never disappeared were distinguished sharply from the rest, and received special attention at a very early date, being regarded as the special representatives of the powers of darkness, and consecrated to Set (= Anubis, Typhon, Tebha), who was at first among the greatest of the gods. At Thebes, where the area of the stars always visible was only about one-fourth of what it is with us, the chief circumpolar stars were those included in the constellations of the Thigh (Great Bear), the Hippopotamus (Draco), and the Jackal (the Little Bear); and these were called respectively the Thigh of Set, the Wife of Set (Taur-t), and the Jackal of Set. As the hippopotamus was not indigenous to Upper Egypt it came in the later astro-mythology to be replaced in great measure by the crocodile. Set or Anubis was sometimes identified with the constellation of Ursa Minor, and was accordingly represented with a jackal's head. More frequently, however, Set is a generic name for all the northern constellations and for the darkness over which they reign.

The Egyptians were great generalisers, and many of the names which are particularly applied to the sun in some specified part of its daily round are so extended as to refer to stars in an analogous position. Thus, the word Horus really signifies the sun or any heavenly body rising. The planet Mars becomes Hor-χuti, the Laughing or Red Horus; Orion rising becomes Sah-Horus, and the most northerly of the stars that rise become Set-Horus. The myth regarding the combat of Horus with Typhon to revenge the death of his father, Osiris, signifies that the rising sun destroys the circumpolar stars, who at twilight had conquered the sun of yesterday. This myth was at first depicted as Horus slaying the hippopotamus or the crocodile (Draco), but in later times when Draco ceased to be circumpolar the Hippopotamus was replaced by the Thigh of Set (Ursa Major), which in 2000 B. C. occupied exactly the same position as Draco had three thousand years before.

Osiris and Isis were, like Horus, generic names for a whole group of analogous celestial phenomena. Osiris stood for any celestial body becoming invisible; not only the setting sun, but the waning moon, or planets and fixed stars at their setting or when paling at dawn. The planet Venus often receives the appellation;

Orion paling before the sun is called Sah-Osiris, and the forms Khons-Osiris, Ptah-Osiris, and Min-Osiris appear to be the stars Canopus, Capella, and Spica at their setting. The mummy form habitually marks a setting star, and the horns and disk a rising one. The one is Osiris and the other Isis.

Isis stands for "anything luminous to the eastward heralding sunrise." Sometimes it is the dawn, sometimes the moon, sometimes γ Draconis, sometimes Antares, sometimes α Centauri, sometimes α Columbae, and sometimes Sirius. As γ Draconis it is synonymous with Hathor (hawk, hippopotamus), Mut (vulture), Sechet or Bast (lion or cat), Menkh, Tafnet, Apet, and Nebun. As Antares it is Serk-t; as α Columbae Techi and Amen-t; as Sirius Hathor (cow) and Râ-t. Anuqua, Hak-t, and Maloul are also forms of Isis, but their astronomical relation has not yet been determined.

Isis in one or another of her forms (Hathor, Remen-t, Serk-t, Râ-t, Amen-t) is often represented as nursing Horus; "the original symbolism is that Isis or Hathor "is the star rising in the dawn, watching over the sun or taking him from his cra-"dle; and the young Horus, the Rising Sun, is, of course, the son of Isis."

Professor Lockyer supports the foregoing identifications by evidence from the inscriptions and other subsidiary sources, but more particularly upon the comparative study of the orientation of the temples in successive periods.

This brings us to the interesting and important conclusions regarding the general religious history of Egypt towards which the data collected by Professor Lockyer point. The monuments seem to represent four schools of religious thought and astronomical interest, devoted respectively to the solstitial sun, the equinoctial sun, the northern stars, and the southern stars. The Northern School is related to the solstitial, and the Southern to the equinoctial; and the evidence, taken altogether, indicates that these two main divisions represent two races which maintained a struggle for the supremacy for more than three thousand years. The outline of the history is reconstructed by Professor Lockyer's hypothesis as follows.

> "6400 B. C. A swarm of worshippers of the moon and the equinoctial sun come down the Nile and possess themselves of the country, which they find occupied by a population worshipping Râ and Atmu. The invaders build temples at Amada, Senneh, Philae, Edfu and elsewhere to Osiris their moon-god, directed towards the autumnal equinox, which marks the beginning of their lunar year. They inaugurate what the Egyptian annals call the divine dynasty of Osiris.
>
> 5400 B. C. Invaders from the north-east bring the worship of Anu and the northern stars. One swarm comes by the Red Sea, and founds temples at Redisieh and Denderah; another may have come over the isthmus and founded Annu. Either they came from northern Babylonia or else other swarms of the same race invaded that country at the same time. The divine dynasty of Set begins.
>
> 5000 B. C. Horus and his Blacksmiths (*Hor Sheshu*) come down the

river to revenge his father Osiris by killing the murderer Set. In other words, they have come to assist the former southern invaders who worship Osiris against their conquerors from the north-east who have replaced him by Set. The southern people have now become sun-worshippers, and Osiris means the sun as well as the moon.

The people from the north-east are beaten, and there is an amalgamation of the *original* and Southern cults. Set is retained, however, and Anubis presides over sepulchres. The priestly headquarters are now at Annu and Abydos. At Annu both the sun and northern stars are worshipped, but at Abydos Osiris, now a sun-god, reigns supreme.

4000 B. C. Another swarm from the north-east, this time certainly from Babylonia and apparently by the isthmus only, since no east and west temples are found on Red Sea routes. They not only worship Anu, but also the spring equinox sun-god.

3700 B. C. The Southern people at Barkal and Thebes in force; temple-building on a large scale. Chnemu begins to give place to Amen-Râ. Still more blending between original and Southern peoples.

3500 B. C. Final blending of North and South cults at Thebes. Temples founded there to Set and Min on the lines of Annu and An.

3200 B. C. The worship of Amen-Râ established at Thebes. Supremacy of the 'Confraternity of Amen.' This marks the final religious unification of the country."

A tentative list of the original members of the rival pantheons is attempted, which we also reproduce.

NORTHERN SCHOOL.

GODS.	GODDESSES.
Ptah = Capella, and the April sun.	Bast-Isis = α Ursa Majoris.
Anubis = Northern constellations.	Taurt-Isis = α Ursa Majoris. γ Draconis.
Min, Khem = May sun.	Menat-Isis = Spica.
Autumn sun.	Serk-Isis = Antares.
Spring sun.	Nit-Isis = Pleiades.

SOUTHERN SCHOOL.

GODS.	GODDESSES.
Osiris = Moon god.	Texi-Isis, Amen-t-Isis, Hathor-Isis = Phact, afterward Sirius.
Chnemu = Sun god, autumnal equinox.	
Khonsu = Canopus, warning star at the autumnal equinox, on the western horizon; followed by	
Serk-t = α Centauri, on the eastern horizon.	

UNITED SCHOOL.

Amen-Râ = Sun god.

The temples, pyramids, and great Sphinx of Gizeh belong to the Southern or Equinoctial School, and the Colossi of Memnon to the Solstitial School.

The inscriptions state again and again that the gods associated with southern stars came from a locality called the Land of Pun-t, which was always considered a holy land. Brugsch supposed it to have occupied the south and west of Arabia Felix, but Maspero and Mariette identified it with a part of Somâli Land bordering on the Gulf of Aden. The inscriptions, especially those at Dêr el Bahair, have made it certain that Pun-t was in Africa. The pictures of Hottentot women, pile-dwellings, and elephants, and references to other products of the country, all point to a southern part of the African continent. This indicates the truthfulness of the ancient tradition recorded by Maspero that the shores of Pun-t were bathed by the waters of an unknown sea (Lake Victoria Nyanza) which could be reached by going up the Nile.

Professor Lockyer strengthens his conclusions by craniological evidence, Virchow testifying that the skulls from the ancient empire are brachycephalic and those from the new dolichocephalic or mesacephalic.

Although Egypt is the principal subject of the book, an interesting series of parallel facts regarding other countries is given. Those referring to Babylonia and Syria are of special importance on account of their bearing on the question of the origin of the Equinoctial School of Egyptian astro-mythology. Also the influence of the Egyptian temple-architecture upon the Greek is traced, and numerous instances of orientation in other countries cited.

Whatever may be thought of the specific conclusions in matters of detail at which Professor Lockyer arrives, it is undeniable that he has opened up a new and exceedingly interesting and important field of research. The history of religions cannot fail to be an immense gainer from this application of exact science to the solution of some of its most fundamental problems.

There is of course danger that the star-theory, like every other explanation of religious origins that has ever been attempted, may be overdone, and structures really built at random, or in relation to terrestrial conditions of some kind, may be too hastily connected with some celestial body or phenomenon. It is conceivable that an apparent orientation might be a mere fortuitous coincidence; though as far as Egypt is concerned there is such a multitude of such instances, and such a converging of all possible lines of evidence towards the same result, as to carry the matter entirely out of the realm of plausible speculation into that of ascertained fact.

But, as Professor Lockyer constantly reiterates, he has merely broken a path into a wonderland whose countless treasures still remain to be gathered by the assiduous investigator. The question of tribal totems and their exact relation to the members of the Pantheon and the heavenly bodies which they represent is an exceedingly interesting one, which calls for much accumulative labor and much care-

ful and painstaking comparison with corresponding features in the religious life of other peoples of every degree of culture all over the globe.

It is scarcely necessary, considering from what press it comes, to add that the typographical get-up of Mr. Lockyer's book is exceedingly good. The paper is excellent, the print is large and clear, and the illustrations well chosen and finely reproduced. In a few instances a plate is laterally reversed, or a pair of reference letters interchanged, but the errors are quite unimportant ones and readily detected.

As the work is one of the most important of the year, and on a subject which is surrounded with obscurities and technicalities, the literary public may well congratulate itself on having it in so attractive and readable a form, and both author and publisher deserve much credit for the result. Σνλ.

FROM THE GREEKS TO DARWIN. An Outline of the Development of the Evolution Idea. By *Henry Fairfield Osborn, Sc. D.* New York and London: Macmillan & Co. 1894. Pp. 259. Price, $2.00.

The present volume forms the opening number of the Columbia University Biological Series edited by Henry Fairfield Osborn, Professor of Biology in Columbia College, and formerly Professor in Princeton. The work is dedicated to Dr. McCosh, and is one of the many good results of the impetus that that lamented teacher gave to the study of philosophy in America. The volume grew out of lectures first delivered in Princeton in 1890 upon the period between Buffon and Darwin, and completed in a fuller course at Columbia in 1893. The chief object of the author is to bring forward the many strong and true features of pre-Darwinian evolution, usually passed over or misunderstood, to place before the reader the evidence of continuity in the development of the evolution idea, and to trace the lines of this development through the history of philosophy. An excellent idea in the plan of the lectures is that of the "environment" of the evolution idea. Professor Osborn sees, and clearly states, that ideas are a product of nature; that they grow and develop like living organisms and that the general features of evolution may be traced in them also. "The "final conception of Evolution is to be regarded as a cluster of many subsidiary ideas, "which slowly evolved in the environment of advancing human knowledge. Like an "animal or plant made up of different parts which have been added one by one along "the ages, we can take up this history as we should a bit of biological research; con- "sider the idea as living and still growing, and seek the first stages of each of its "parts." The title of the work is a happy one, and seems to have been suggested by Zeller's *The Greek Predecessors of Darwin.* The excellent bibliography appended to the lectures shows that Professor Osborn has employed the best obtainable sources in the philosophy of the subject, and although he lays little claim to originality in the conception and execution of the work, his reputation as a practical biologist leads the reader to expect that his material will be placed under new and instructive points of view.

Throughout the whole history of philosophy and science, the speculations upon

the origin of life and the nature of the organic world form a continuous whole. The influence of early upon later thought is greater than is usually believed, and especially to the Greeks Darwin owes more than has been recognised or at least been explicitly stated. The evolution-law was not reached by any decided leap, but by the progressive development of a large group of subordinate ideas. To trace these lesser ideas to their sources, and to bring the comparatively little known early evolutionists into their true relief is, as above stated, the task which Professor Osborn sets himself. The non-appreciation of the continuity of evolution thought, with the lack of sense of proportion as to the original merits of different writers, he finds to be the greatest defects in the historical literature of the subject. For example, he thinks that Haeckel has far overstated the merits of Oken, who shines forth brightly in certain passages, but goes under a cloud in others. His own method is to get an estimate of each author as a whole before showing his connexion with the idea in individual and isolated points. To take two other instances, Krause has placed Erasmus Darwin over Lamarck without sufficient consideration, and Huxley has treated Treviranus and Lamarck with almost equal respect, while it is Professor Osborn's opinion that Treviranus in spite of his high merits is hardly to be compared with Lamarck, so far as real solid contributions to the modern ideas of evolution are concerned.

In the Introduction we have an outline of the whole development of the evolution idea. Taking Bacon's dictum regarding the anticipation and interpretation of nature as his guide the author finds the following stages in the discovery of the law, to-wit: (1) The anticipation of nature—Greek evolution—which beginning with the old Greek physiologers continues through Arabic philosophy to mediæval Christian theology; (2) the interpretation of nature—modern evolution—exhibited in the emancipation of botany and zoölogy from Greek traditions and in the speculations of the philosophers of the seventeenth and eighteenth centuries; (3) modern inductive evolution which embraces two periods, that from Buffon and St. Hilaire, marked by the rapid extension of the natural sciences, and that of Darwin and Wallace, when evolution is established inductively and deductively as a law of nature.

The early Greeks were mainly deductive or *a priori* in their scientific method. This also characterised mediæval and even modern thought upon evolution. The facts strangely contradict the current views of the history of this idea. The very men who recommended induction practised it least successfully. Some early Christian Fathers were more liberal and rational than some very modern precursors of evolution. Augustine ridiculed the error of searching the Scriptures for laws of nature, and gave a broad and modern interpretation of the first chapter of Genesis, whilst the theory of special creation, which, we might say, he rejected, was held by eminent naturalists as late as the nineteenth century. The accumulation of the natural evidences of evolution, which fell mainly in the third period, was the work of centuries. First came correct ideas of structure or comparative morphology, then the knowledge of function or physiology, then true ideas of individual development

or embryology, finally, natural environment began to be studied and the facts of distribution, and with all grew palæontology. Analogy, homology, adaptation, degeneration were noticed, and lastly, but chiefly, the doctrine of abiogenesis which formed one of the greatest impediments to the growth of the true evolution idea, was overthrown, and natural causation substituted for supernatural in the world of organisms.

Looking over the contributions of the Greeks to the idea of evolution, we find in Thales the idea of the aquatic or marine origin of life; in Anaximander, who is termed by Haeckel the prophet of Kant and Laplace in cosmogony, and of Lamarck and Darwin in biology, the dim notion of survival and persistence in difficult circumstances, and the doctrine of abiogenesis. In Anaximenes and Diogenes of Apollonia we discover the idea of a primordial terrestrial slime—the prototype of Oken's *Urschleim*—from which animals are directly derived abiogenetically. In the teachings of Empedocles is found the germ of the theory of the survival of the fittest or of natural selection. Empedocles modified the abiogenetic hypothesis, and adumbrated, so to speak, the following truths of modern evolution: "First, that "the development of life was a gradual process; second, that plants were evolved "before animals; third, that imperfect forms were gradually replaced (not suc-"ceeded) by perfect forms; fourth, that the natural cause of the production of per-"fect forms was the extinction of the imperfect." Empedocles's position on these matters is very important, and greatly influenced later thought. His view of adaptation as applicable only to organisms as a whole was extended by Democritus to embrace the adaptation of single structures in individual organs. We next come to Aristotle, who of all the ancients, and also of all inquirers till most recent times, showed the clearest insight into the nature of the problem of life. Aristotle's importance has been strangely overlooked, and it is one of Professor Osborn's chief claims to place him in his right light. Aristotle's knowledge of natural history was for his time marvellous; he may be said to have created the science. The centuries preceding him yielded nothing but vague speculation. "I find no basis pre-"pared," he says. "No models to copy. Mine is the first step." "He was the "first to conceive of a genetic series, and his conception of a single chain of evo-"lution from the polyps to man was never fully replaced until the beginning of this "century." He first studied lower types. He distinguished five hundred species of mammals, birds, and fishes. His biological essays show that he fully recognised analogies between the different organs, he perceived the unity of plan or type in certain classes of animals; he rightly conceived of life as the function of the organism, not as a separate principle; he anticipated Harvey's doctrine of epigenesis; he perceived the forces of hereditary transmission, of atavism or reversion, as also the principle of compensation of growth. Moreover, his main ideas upon evolution seem to have been drawn from observation. Aristotle believed in a complete gradation of nature, a progressive development corresponding with a progressive life of the soul. We have spoken of his chain of evolution beginning with polyps and end-

ing in man. The progressive development mentioned was affected by a sort of metaphysical principle which has not yet disappeared from science, and which in modern phraseology we should call an "internal perfecting tendency," which drives organisms progressively forward into more perfect types. Certain quoted passages contain, as Professor Osborn thinks, "absolute evidence that Aristotle had sub-"stantially the modern conception of the evolution of life, from a primordial, soft "mass of living matter to the most perfect forms, and that even in these he believed "evolution was incomplete, for they were progressing to higher forms." He combated Empedocles's suggestion of the survival of adapted and extinction of inadapted beings; had he accepted Empedocles's hypothesis, says Professor Osborn, he would have been the literal prophet of Darwinism.

There is little of interest in the subsequent ancient philosophers. Epicurus's chief merit is to have established the natural *versus* that of supernatural causation. Lucretius did nothing but restate the doctrines of Empedocles; we cannot speak of him as an evolutionist, "in the sense of gradual development by descent." Coming to the theologians, we find only in Gregory of Nyssa and in St. Augustine the attempt at a naturalistic interpretation of the order of creation. "The reaction "against the scientific reading of Genesis came when Christian theology shook off "Aristotelianism. . . . No advance whatever in a development of the evolution idea "was made in this long period," which lasted until 1600, except among the Arabs.

In passing to what Professor Osborn calls the natural philosophers we reach the period of the rise of natural science in the sixteenth, seventeenth, and eighteenth centuries. Here we have three classes of writers, the "Naturalists," the "Speculative Evolutionists," and the "Natural Philosophers." The first built up the future materials of evolution-thought, the second promulgated only unsound metaphysical ideas, the third, including such men as Bacon, Descartes, Leibnitz, Hume, Kant, Lessing, Herder, and Schelling, really gave the modern methods of studying the evolution problem. They perceive the importance of the principle of variation, gradations of type, as also the necessity of a general evolution of life. We need not tarry long with these men, but only say a word of Kant. "The finest and the "fullest expression of evolution in philosophical literature is found in Kant." In a famous passage in Kant, now well known, "we can trace the influence," says Professor Osborn, "of every earlier philosopher from Aristotle down, and recognise "the problems which have faced every later one." Also in that giant of thought, Herder, we find much. "Herder clearly formulated the doctrine of *unity of type*, "which prevailed among the evolutionists of the period immediately following."

The writings and achievements of the evolutionists of the eighteenth century are in the main familiar. Still, a few points may be noticed. Referring to the common overestimate of Oken as a prophet of modern evolution, Professor Osborn says; "In fact, when we analyse his contributions, we find that they actually "represent the last survivals of Greek evolution with a veneer of eighteenth-century "progress. When we read him through and through we see that he is about as

"truly an anachronism as old Claude Duret of 1609"—Claude Duret, who told the story of a tree in Scotland, from which falling leaves striking water on one side were transformed into fishes and striking land on the other were turned into birds. Charles Bonnet (1720–1793), though not an evolutionist, is remarkable as the author of the term. Strange to say, it meant then not evolution but something else, the term abiogenesis corresponding more to the meaning of the modern idea. Of the great naturalists, Linnæus was important merely as the founder of the "School of Facts," of which Cuvier was later the leader. The merit of Buffon, who "may be called the naturalist founder of the modern form of the evolution "theory," was his suggestiveness. "He may be said to have asked all the ques- "tions which were to be answered in the course of the succeeding century." In Erasmus Darwin much of interest is found. For example, "the first clear and "definite statement of the theory of the transmission of acquired characters consid- "ered as one of the factors of evolution."

Chapters V and VI of the work are entitled, respectively, "From Lamarck to St. Hilaire" and "Darwin." "Lamarck (1744–1829), as the founder of the complete "modern theory of Descent, is the most prominent figure between Aristotle and Dar- "win." Professor Osborn's discussion of his achievements is full and fair. Goethe, too, comes in for an appreciative estimate, but Treviranus, the author thinks, is overrated, not going beyond Buffon and virtually taking the position held much earlier by Goethe. Of Darwin nothing need be said here. The author closes with these words: "It is for the future to determine whether the predecessors of Darwin "and Darwin himself, in the principle to which he gave a life of thought, have fully "answered the old, old problem, or whether we shall look for still another Newton "in our philosophy of Nature."

In Professor Osborn's work, we gain a very fair idea of the movement of the evolution idea and of its significance, and it may be cordially recommended to those who wish to obtain a preliminary survey of the subject. It is remarkably free from typographical errors[1] which is very important in such a work, and is printed on good paper in a fine, large type. It is to be hoped that the works which follow it will be as useful and interesting. T. J. McC.

AMPHIOXUS AND THE ANCESTRY OF THE VERTEBRATES. By *Arthur Willey*, B. Sc. With a Preface by Henry Fairfield Osborn. New York and London: Macmillan & Co. 1894. Pp., 316. Price, $2.50.

The present treatise constitutes the second volume of the Columbia University Biological Series, opened by Professor Osborn's *History of the Evolution Idea*, and although of a technical and special nature, is, by the subject which it treats, of high general interest and importance. That subject is the ancestry of the vertebrates

[1] On page 113 the author refers to a paper of Maupertuis on "The Conservation of Energy Doctrine." Maupertuis never considered that subject; what is meant is the principle of least action.

from the point of view of the anatomy and development of *Amphioxus lanceolatus*. This little animal, varying from two to three inches in length, is the actual living realisation of the ideal imaginary representative of the primitive vertebrate, almost identical with the archetypal form supposed by evolutionists. "It is interesting," says Mr. Willey, "as being one of the few animals that were not known to Aristotle, having been described and figured for the first time in 1778 by the German zoölogist Peter Simon Pallas." Its true nature, however, was not recognised until it was rediscovered in 1834 in the Mediterranean seas by the Italian naturalist, Gabriel Costa, who showed that it was a fish. The name of Amphioxus was first given to it by William Yarrell in 1836, Pallas having called it *Limax lanceolatus*, thinking it a species of slug. Yarrell first discovered the notochord of Amphioxus as a cartilaginous vertebral column. Finally, in 1841 three memoirs appeared independently on the anatomy of Amphioxus, which laid the foundation of our present knowledge. Their authors were John Goodsir of Edinburgh, Heinrich Rathke of Königsberg, and Johannes Müller of Berlin. The work of the last named author, universally recognised as the greatest physiologist of the nineteenth century, was a masterpiece. It was established by these researches that Amphioxus was allied to the Cyclostomata, but differed from them, according to Johannes Müller, to a greater extent than a fish differs from an Amphibian. It inhabits shallow, sandy shores, its food consisting almost entirely of microscopic plants and vegetable *débris*. Its extreme shyness to a bright and sudden light is remarkable, being "probably correlated with the presence of black pigment spots in the nerve-cord." It occurs in astonishing abundance in the extensive salt-water pools near Messina, less abundantly in more temperate regions, but is found in greater or less numbers in nearly all parts of the temperate and tropical world. Yet world-wide as this distribution is, there is only a single genus with some eight species. When we add to this the fact that it is a shore-dweller and not a roving pelagic animal, it is evident beyond dispute that we have in Amphioxus an immensely archaic form of vertebrate.

A few words on the anatomy of this remarkable creature will directly establish its significance. It has no specialised head, no skull, brain, or jaws; it is destitute alike of limbs, of a centralised heart, of a developed liver, kidneys, in short of most of the organs which usually belong to vertebrata. It has, however, a rudimentary backbone in the form of what is called the notochord. To be brief, it is almost as nearly allied to a worm as it is to a fish. Now what is permanent as a cartilaginous notochord in Amphioxus is transitory in the embryos of the higher vertebrates. In other respects, too, there is a correspondence between the early embryonic history of vertebrates and the permanent condition of Amphioxus. The link between the vertebrates and Amphioxus and between Amphioxus and the worms, as shown in *Balanoglossus*, an isolated type of this class, is almost perfect, forming a very strong piece of evidence for the derivation of the vertebrates from the worms. "For the present," says Mr. Willey, "we may conclude that the proximate ancestor of the vertebrates was a free-swimming animal intermediate in organisation between an

Ascidian tadpole and Amphioxus. . . . The ultimate or primordial ancestor of the Vertebrates would be a worm-like animal whose organisation was approximately on a level with that of the bilateral ancestors of the Echinoderms," or, to quote Professor Osborn, who writes the Preface to the work, "it stands as a persistent specialised but not degenerate type, perhaps not far from the true ancestral line of the Vertebrates."

Mr. Willey's work is exhaustive, at least it will appear so to the general reader; but a glance at the bibliography appended to the work, containing six pages of reference in small print, will show that in fact it is only an introduction to this tremendous subject. "No single group," says Professor Osborn, referring to the Protochordates, "illustrates more beautifully the principles of transformism. . . . They alone [the Ascidians] give us a whole chapter in Darwinism." In fact no biological subject could be more fascinating. The problems presented are sketched in the Introduction. We shall mention only the problem of Dohrn, which is of more recent interest. "According to him," says Mr. Willey, "not only were the Vertebrates *not* descended from forms allied to the Ascidians and Amphioxus, but the latter were, by a process of almost infinite *degeneration*, derived or degenerated from the former. That the Ascidians are degenerate animals, to the extent that they have become adapted to a fixed habit of life, is of course obvious; but that they have phylogenetically undergone the immeasurable degeneration which was postulated by Dohrn, is a view which is entirely unjustified by facts." The first two chapters are devoted to the anatomy of Amphioxus, the third to the development of Amphioxus, the fourth to a brief sketch of the structure and development of the typical Ascidians, and the fifth to a consideration of the more abstruse relationships of the lower Vertebrates or Protochordates. The work concludes with a series of considerations on the features of transition between the craniate vertebrates, the protochordates, and the invertebrates. With its notes, illustrations, full index, good press-work, and fine treatment of its subject, Mr. Willey's work upholds the reputation which the Columbia Biological Series has already won for high excellence. T. J. McC.

THE RIDDLE OF THE UNIVERSE. Being an Attempt to Determine the First Principles of Metaphysic, Considered as an Inquiry Into the Conditions and Import of Consciousness. By *Edward Douglas Fawcett*. London: Edward Arnold. 1893. Pp., 440. Price, 14s.

"The object of this work is a Metaphysic which, stalking naked, but not "ashamed, among current iconoclasms, shall proffer a definite though necessarily "tentative, solution of the World-Riddle." This solution the author hopes to expand in a future series of works. The present volume which forms a sort of prelude to the promised system is divided into two parts. "In Part I is presented a "critical survey of the great *landmarks* in the history of modern philosophy, with "a *primary* reference to their bearing on *metaphysical* (as opposed to merely psycho-"logical and other) inquiries. . . . Part II is constructive, a *development*, and, it is

"hoped, an extensive development, of Metaphysic out of the materials furnished by "the great German masters. Incidentally Part II is critical, assailing: (*a*) the vari- "ous phases of materialism, agnosticism, and current *destructive* idealism; (*b*) that "too prevalent word-jugglery, termed by Schopenhauer 'University-philosophy,' "where verbal erudition supplants insight, and dialectical chatter honest confronta- "tion of the enigmas of life; (*c*) theology, and all metaphysic and ethic subservient "to theology; (*d*) the defective side of modern mysticism," meaning by the "de- fective side" the aberrations of mysticism. In the constructive side of Part II are to be noted, to use the author's own list, "the treatment of the *crux* of the Indi- "vidual Ego or Subject, the Subjective-Objective Idealism, the Monadology with "its suggested amendments of Leibnitz and Herbart, the theories of Freedom and "the relations of neurosis and psychosis, the exposition of the Universal Subject "(including the synthesis of Atheism, Pantheism) and Theism, the answer to Pes- "simism and the riddle of Evil at large, the struggle for existence of Monads (as "the metaphysical complement of Darwinism and ἀνάγκη θεία of the universe solving "very numerous riddles), and the novel handling of palingenesis."

Mr. Fawcett writes a robust and picturesque style, at times almost verging on Orientalism. The vigor and the individuality of his expositions hold the attention of the reader throughout. It will be impossible for us within the brief space now at our disposal to do more than to refer to his chief positions. To criticise thor- oughly his views would be to discuss the whole history of philosophy. We shall point out merely the idiosyncrasies of his views.

The method employed, not the only possible method, but still a very effective one, is called the "concrete metaphysical method," which is a "regress from the "empirical in general to its grounds, thoroughgoing deduction of the empirical *in* "*detail* from these grounds with the concrete ever in view." Concreteness, always concreteness, is its ideal. It is by the concrete method, not by abstractions, that the peak of the Absolute is to be scaled. The key to this philosophy is the "doc- trine of a subject distinct from states of consciousness, though distinct in a way needing most careful treatment." Its initial formula "states of consciousness ap- pear" is ultimately resolvable into "states of consciousness appear as content and revelation of a Subject,"—and that an *individual*, not a universal subject "No "Subject," Mr. Fawcett declares, "no flux of sensations in time; no Subject, no "order of sensations in space; no Subject, no memory, no expectation; no Sub- "ject, no introspection; no Subject, no explicit I-reference." Now our states of consciousness have two sides—our mental consciousness and our object conscious- ness. This involves the problem of external perception which Mr. Fawcett attempts to solve "by a theory fusing the standpoints both of subjective and objective ideal- ism." In this connexion a doctrine of Monadology is developed, which is the core and pride of Mr. Fawcett's philosophy. A monad is "a unitary individual centre of consciousness, actual or potential." Although applicable, as Mr. Fawcett thinks, and fit to replace the complicated and self-contradictory atomic theories of physics

and chemistry, in this place it is applied only to the solution of the general metaphysical problem. In the first place, we have a Universal Subject, called the Metaconsciousness. In this subject the monads are grounded, by it they are connected, although individually they are discreet and self-contained centres. In themselves the monads are subject simply to changes of state; but as upheld in the Universal Subject free interactions must be posited of them. In this interplay, in this interpenetration of the monads, the solution of the various problems is reached, including, of course, that of telepathy, and the possibility of mysticism.

It remains only to indicate Mr. Fawcett's solution of the problem of God, his reply to pessimism, and his theory of palingenesis. His view of God "constitutes a synthesis of the standpoints of Atheism, Pantheism, Theism, and even Agnosticism." Deity is found to emerge from the gloom of the Metaconscious, the Metaconscious being the black spiritual *prius* in which all the monads are immanent. "The God of Absolutism is all that is, ever was, or ever shall be—a unity of inter-"penetrative individuals who have bought their glory by suffering." According to Mr Fawcett, the foundation of pessimism is a fact; "the reply to pessimism must "hinge on the report we may be able to return of the individual's prospect beyond "the grave. . . . *The fact is that, here as elsewhere, human ideals, unless they are to "bear rich fruit in 'another world,' are a cheat of the emptiest nature.*" That other world is the future, for monads are immortal. "The Good, after all, must be fated "to emerge from this torment. Hail, then, to the unborn future! The pains of the "world accumulate *behind* us, but the banqueting-day, the revels of a Deity, are "ahead." Again, pain and pleasure are the lieutenants of the Metaconscious. . . . Pain and pleasure are, broadly speaking, the servants of the animal body." The indictment of pessimism cannot be answered, unless we believe that consciousness persists. "*Persistence of individuals as conscious is deducible from the belief in the self-realising Metaconscious previously vindicated.*" Now this persistence takes the form of palingenesis. The humblest atom-monad undergoes a ceaseless palingenesis. Just as the hydrogen-monad takes different states in different combinations, so the human monad enters into "rebirths." This doctrine of palingenesis throws new light on many phases of the ethical problem, and has been hinted at in various religious systems and philosophies.

To sum up, in individual monads "now blazing with the light of consciousness, now withdrawing into darkness," are laid the foundations of reality. "The Individual is the only concrete, and should dwarf all else whatever." μκρκ.

PERIODICALS.

THE PSYCHOLOGICAL REVIEW. VOL. I. Nos. 5 and 6.

STUDIES FROM THE HARVARD PSYCHOLOGICAL LABORATORY (II.): *A.* The Motor Power of Ideas: *Hugo Münsterberg* and *W. W. Campbell*. *B.* Memory: *John Bigham*. *C.* The Localisation of Sound: *Hugo Münsterberg* and *Arthur H. Pierce*. *D.* Association: *Mary Whiton Calkins*. *E.* Æsthetics of Simple Forms; Symmetry: *Edgar Pierce*.—THE IMAGERY OF AMERICAN STUDENTS. By *A. C. Armstrong, Jr.*—THE PENDULUM AS A CONTROL-INSTRUMENT FOR THE HIPP CHRONOSCOPE By *Lightner Witmer*.

THE THEORY OF EMOTION: (I.) EMOTIONAL ATTITUDES. By *John Dewey*.—THE STUDY OF A CASE OF AMNESIA OR "DOUBLE CONSCIOUSNESS." By *Charles L. Dana*.—EXPERIMENTS IN SPACE PERCEPTION (II.). By *James H. Hyslop*.—AN EXPERIMENTAL STUDY OF MEMORY. By *E. A. Kirkpatrick*.—DISCUSSION, ETC.—(New York and London: Macmillan & Co.)

THE PHILOSOPHICAL REVIEW. Vol. III. No. 6.

THE CONSCIOUSNESS OF MORAL OBLIGATION. By *President J. G. Schurman*.—HEGEL'S CONCEPTION OF FREEDOM. By *Prof. S. W. Dyde*.—RELATION OF HUMES'S TREATISE AND INQUIRY. By *Prof. W. B. Elkin*.—GERMAN KANTIAN BIBLIOGRAPHY (x). By *Dr. Erich Adickes*.—DISCUSSION: THE EGO, CAUSALITY, AND FREEDOM. By *Prof. James H. Hyslop*.—BOOK REVIEWS.—(Boston, New York, Chicago: Ginn & Co.)

INTERNATIONAL JOURNAL OF ETHICS. Vol. V. No. 1.

LUXURY. By *Prof. Henry Sidgwick*.—THE LIMITS OF INDIVIDUAL AND NATIONAL SELF-SACRIFICE. By *F. H. Bradley*.—WOMEN IN THE COMMUNITY AND IN THE FAMILY. By *Mary S. Gilliland*.—ETHICS AND BIOLOGY. By *Edmund Montgomery*.—NATIONAL CHARACTER AND CLASSICISM IN ITALIAN PHILOSOPHY. By *Luigi Ferri*.—RATIONAL HEDONISM. By *E. E. Constance Jones*.—DISCUSSIONS.—BOOK REVIEWS.—(Philadelphia: International Journal of Ethics, 1305 Arch Street.)

THE NEW WORLD. Vol. III, No. 11.

UNIVERSAL RELIGION. By *John W. Chadwick*.—THE INFLUENCE OF PHILOSOPHY ON GREEK SOCIAL LIFE. By *Alfred W. Benn*.—ANIMISM AND TEUTONIC MYTHOLOGY. By *P. D. Chantepie de la Saussaye*.—THE ROOTS OF AG-

NOSTICISM. By *James Seth.*—GIORDANO BRUNO'S "EXPULSION OF THE BEAST TRIUMPHANT." By *William R. Thayer.*—THE SERVICE OF WORSHIP AND THE SERVICE OF THOUGHT. By *Charles F. Dole.*—THE RESURRECTION OF JESUS. By *Albert Réville.*—TRUTH AS APPREHENDED AND EXPRESSED IN ART. By *G. F. Genung.*—BOOK REVIEWS.—(Boston: Houghton, Mifflin & Co.)

MIND. NEW SERIES, No. 12.

A DIALOGUE ON TIME AND COMMON SENSE. By *Professor Sidgwick.*—AN ANALYSIS OF ATTENTION. By *A. F. Shand.*—PSYCHOLOGY, EPISTEMOLOGY, ONTOLOGY, COMPARED AND DISTINGUISHED. By *S. H. Mellone.*—THE PHILOSOPHY OF LORD HERBERT OF CHERBURY. By *W. R. Sorley.*—ASSIMILATION AND ASSOCIATION (II.). By *Dr. James Ward.*—DISCUSSIONS, ETC.—(London and Edinburgh: Williams & Norgate.)

REVUE PHILOSOPHIQUE. Vol. XIX. No. 10.

DE LA SUGGESTIBILITÉ NATURELLE CHEZ LES ENFANTS. By *A. Binet* and *V. Henri.*—THÉORIE DU JUGEMENT ET DU RAISONNEMENT DÉDUCTIF DANS LA "LOGIQUE" DE WUNDT. By *H. Lachelier.*—COMPRÉHENSION ET CONTIGUÏTE. By *V. Egger.*—RECHERCHES SUR LA MÉMOIRE AFFECTIVE. By *Th. Ribot.*—NOTES ET DISCUSSIONS.—(Paris: Felix Alcan.)

REVUE DE MÉTAPHYSIQUE ET DE MORALE. Vol. II. No. 5.

LE PROBLÈME DE LA SOCIOLOGIE. By *G. Simmel.*—SUR LA MÉTHODE MATHÉMATIQUE. By *E. Le Roy* and *G. Vincent.*—UNE ÉTUDE RÉALISTE DE L'ACTE ET SES CONSÉQUENCES MORALES. By *J. Weber.*—NOTES CRITIQUES.—(Paris: Librairie Hachette et Cie.)

PHILOSOPHISCHE MONATSHEFTE. Vol. XXX. Nos. 7, 8, 9, and 10.

UEBER SOKRATES. By *P. Natorp.*—ETHISCHER RIGORISMUS UND SITTLICHE SCHÖNHEIT. Mit besonderer Berücksichtigung von Kant und Schiller. II. By *K. Vorländer.*

DAS SYSTEM DER KÜNSTE. Eine ästhetische Studie. By *O. Kleinenberg.*—TRANSCENDENTALPSYCHOLOGIE. Eine kritische Studie. By *W. Enoch.*—ETHISCHER RIGORISMUS UND SITTLICHE SCHÖNHEIT. Mit besonderer Berücksichtigung von Kant und Schiller. III. By *K. Vorländer.*—LITTERATURBERICHT.—(Berlin: Georg Reimer.)

ZEITSCHRIFT FÜR PSYCHOLOGIE UND PHYSIOLOGIE DER SINNESORGANE. Vol. VII. Nos. 5 and 6.

DIE WAHRNEHMUNG VON BEWEGUNGEN VERMITTELST DES AUGES. By *L. William Stern.*—UEBER DAS TRAUMLEBEN DES BLINDEN. By *Friedrich Hitschmann.*—DIE WAHRNEHMUNG VON HELLIGKEITSVERÄNDERUNGEN. By *L. William Stern.*—LITTERATURBERICHT.—(Hamburg and Leipsic: Leopold Voss.)

PHILOSOPHISCHES JAHRBUCH. Vol. VII. No. 4.

UEBER DEN PLATONISCHEN GOTTESBEGRIFF. (Continued.) By *J. Nassen.*—UEBER MESSBARKEIT PSYCHISCHER ACTE. (Continued.) By *C. Gutberlet.*—

Dr. Al. Schmid über die Erkenntnisslehre. (Concluded.) By *S. J. Tilm. Pesch.*—Die Coppernicanische Hypothese und die Sinnestäuschungen. By *C. Th. Isenkrahe.*—Recensionen, etc.—(Fulda: Fuldaer Actien-Druckerei.)

THE RIKUGO ZASSI. Nos. 165, 166, and 167, (In the Japanese language.)

On the Study of Comparative Religions. By *N. Kishimoto.*—On the Emotion of Shame. By *Y. Motora.*—Discovery of Deuteronomy. By *K. Yuasa.*—Review of "Attacks Upon Christianity." (Concluded.) By *T. Harada.*—Poushkin's Position in Russian Literature. (Concluded.) By *M. Konishi.*—Miscellaneous.

Conscience: Its Different Senses. By *H. Onishi.*—Beginnings of Religion. By *N. Kishimoto.*—Christian Experience. By *Y. Mashino.*—Mo'-Tsz' and His School. (I.) By *T. Fujita.*—Fine Arts of the Higashiyama Age. By *R. Adachi.*—Book Reviews and Notices.

Pauline Christology. By *T. Murai.*—Pope and Social Problem. (III.) By *E. Ono.*—Beginnings of Religion. (Concluded.) By *N. Kishimoto.*—The Golden Bridge. By *A. Lloyd.*—A History of the Introduction of Christianity in Japan. (VII.) By *S. Watanabe.*—Miscellaneous.

VOL. V. APRIL, 1895. NO. 3.

THE MONIST.

THE WORLD'S PARLIAMENT OF RELIGIONS.

EVER since the close of the World's Congresses of 1893, which opened on the 15th of May and held their final session on the 28th of October, and which embraced in more than two hundred general divisions of twenty departments nearly all the great interests of enlightened humanity, streams of comment, chiefly on the World's Parliament of Religions as the supreme event of the series, have flowed to Chicago from all parts of the world, showing a world-wide interest in the proceedings and a desire to know more fully the facts in relation to them.

For the most part, those streams of comment have been pure, reflecting the splendors of the skies and the beauties of the fields through which they flowed; but occasionally they have borne the driftwood of ignorance, mistake, and prejudice, and sometimes even the impurities of misrepresentation and unkind epithet. This, however, is only what should have been expected, for it is only in the ideal realm that ideal perfection can be found. Let us therefore be thankful there has been so much of appreciation and praise, and so comparatively little of unkind expression.

That the movement which took the form of organised effort in 1889, and culminated in the actual holding of the World's Congresses of the World's Columbian Exposition in 1893 has steadily increased in breadth and power since the close of the congress season, and that this movement will continue to influence mankind for generations to come, has been evidenced in many ways. Perhaps the most noteworthy event that distinguished the opening of the

present year was the World's Congress Reunion and Celebration of the Parliament of Religions, held in the Chicago Auditorium on the evening of the last New Year Day. Almost spontaneously a great demonstration was arranged and triumphantly executed. The programme was remarkably varied, comprehensive and imposing, and the character and enthusiasm of the audience were worthy of the occasion. It is not the purpose of the present article to give an account of that celebration, which it is hoped will be otherwise adequately presented to the reading public.

Prompted by the events of the past year, and especially by that to which reference has just been made, the Editor of *The Monist* has requested the writer to set forth, as briefly and clearly as possible, the fundamental nature and basis of that part of the great general movement which relates especially to the Parliament of Religions. I have accordingly undertaken to state, in a compact form, the underlying principles and the controlling rules and regulations under which the marvellous success of that memorable convocation was attained.

With remarkable accord, the leaders of progress in all lands have recognised the World's Congresses of 1893, crowned by the Parliament of Religions, as constituting an epoch-making event in the history of human progress, marking the dawn of a new era of brotherhood and peace. But here and there a note of discord has been heard breaking against the harmony of the general anthem of praise. This is not surprising, for differences of opinion on every subject must exist; but it is remarkable that most of the criticisms have come from persons assuming to speak in the name of Christianity. This curious circumstance naturally awakened a desire to know, more explicitly, the nature, scope, and purposes of the Religious Congresses of 1893; and why it is, and how it is, that a great religious assembly, which, for seventeen successive days, was opened with the prayer that Jesus taught to his disciples, the representatives of all the religions of the world reverently joining in its devout recital, has been or can be a subject of censure from persons who claim to be his followers. Evidently there is some mistake in regard to the matter. Let us endeavor to see what it is.

In a certain high and representative sense, the Parliament of Religions was an exemplification of monism in religion. For it showed that with all the differences in the forms of religion, there is, nevertheless, something underlying them all, which constitutes an incorruptible and indestructible bond of brotherhood, which, like a golden cord, binds all the races of men in one grand fraternity of love and service. What that enduring something is, may be found quite explicitly set forth in the Christian Scriptures. The Gospel of St. John declares, among many similar things, that there is a True Light which lighteth every man that cometh into the world; namely, the light of the Word which was in the beginning with God, and which was made flesh and dwelt among men in the form of the same Jesus whose prayer voiced the daily supplications of the Parliament of Religions. (St. John, i, 9.)

And the great apostle Peter, who had fallen into the error of supposing that Christian salvation was for the Jews only, and had been cured of this error by a symbolic instruction, also declares that in truth God is no respecter of persons, but in every nation he that feareth Him and worketh righteousness is accepted of Him. (Acts, ix, 34, 35.)

It is also the clear doctrine of the Church that God hath not left himself without a witness among any people; but that there is an influx from God into the mind of every human being, teaching that there is a God, and that he should be loved and served. Hence, if any one really be a genuine Christian, it would seem impossible for him to do otherwise than ardently desire to come into just such a relation with all other men as the Christians had with the representatives of other faiths during the seventeen days of the Parliament of Religions, and have since continued to enjoy with them through correspondence and otherwise.

It may be well, in this connexion, to mention a few things which the Parliament of Religions was not intended to be. It was not a scheme to form a new religion. It was not a project to put the representatives of any form of faith in any false position. It was not a trap set to catch any unwary visitors to the World's Fair. But, on the contrary, the World's Parliament of Religions was a friendly

conference on the basis of the golden rule of Christ; a royal feast to which the representatives of every faith were asked to bring the richest fruits and the fairest flowers of their religion. The supreme object of the festival was to end religious strife and persecution; and to secure to every human being, as far and as rapidly as possible, the sacred right to worship God according to the dictates of his own conscience. To that end, *no participant was asked to surrender any conviction of what he believed to be truth and duty;* nor was any representative of any faith asked to take any part which would compromise him in his relations to his own church. Those who took the active and responsible part in the organisation of the Parliament of Religions had no more fear that any injury might come from it to the Sun of Righteousness than they had that it would work harm to the sun of the firmament.

The original proclamation of the World's Congresses of 1893 embraced, among other great themes to be considered, "the grounds of fraternal union in the language, literature, domestic life, RELIGION, science, art, and civil institutions of different peoples." In organising the Department of Religion, the following definitions and aphorisms were prefixed to the preliminary publication of the department.

"Religion: Real piety in practice, consisting in the performance of all known duties to God and man.—*Law Dictionary.*

No society can be upheld in happiness and honor, without the sentiment of religion.—*Laplace.*

Life and religion are one, or neither is anything.—*George McDonald.*

All religion has relation to life, and the life of religion is to do good.—*Swedenborg.*

All religion is summed up in these two words—Law and Gospel; and these two words in one word—Love.—*Lyman Abbott.*

Pure religion and undefiled before our God and Father, is to visit the widows and fatherless in their affliction, and keep oneself unspotted from the world.—*James* i, 27.

What doth the Lord require of thee, but to do justly, and to love mercy, and to walk humbly with thy God?—*Micah* vi, 8.

All things whatsoever ye would that men should do to you, do ye even so to them, for this is the law and the prophets.—*Matthew*, vii, 12."

The general object of the proposed religious congresses we declared in that publication to be :

"To unite all religion against all irreligion ; to make the golden rule the basis of this union ; to present to the world in the religious congresses to be held in connexion with the Columbian Exposition of 1893, the substantial unity of many religions in the good deeds of the religious life ; to provide for a World's Parliament of Religions, in which their common aims and common grounds of union may be set forth, and the marvellous religious progress of the nineteenth century reviewed ; and to facilitate separate and independent congresses of different religious denominations and organisations, under their own officers, in which their business may be transacted, their achievements presented, and their work for the future considered."

The following themes were mentioned as appropriate to indicate the general scope of the department, and more especially to elicit the suggestions of the committees, advisory councils, honorary members and others interested, to be utilised in making the final arrangements for the religious congresses :

"*a*. The idea of God, its influence and consolations.

b. The evidences of the existence of God, especially those which are calculated to meet the agnosticism of the present time.

c. That evils of life should be shunned as sins against God.

d. That the moral law should be obeyed as necessary to human happiness, and because such is the will of the Creator.

e. That the influence of religion on the family life is to make it virtuous and pure.

f. That the influence of religion on the community is to establish justice, promote harmony, and increase the general welfare.

g. That the influence of religion on the State is to repress evil,

vice, and disorder in all their forms, and to promote the safety and happiness of the people.

h. That conscience is not a safe guide, unless enlightened by religion and guided by sound reason.

i. That of a truth, God is no respecter of persons, but in every nation he that feareth Him, and worketh righteousness is accepted of Him.

j. That throughout the world the substantial fruits of sincere religion include the following: Improved personal character; better business methods; nearly all the works of charity; improved domestic order; greater public peace, etc.

k. That the weekly rest-day is indispensable to religious liberty, and to the general welfare of the people.

l. The triumphs of religion in all ages.

m. The present state of religion throughout the world, including its marvellous advances during the present century.

n. The statistics of churches as an answer to the alleged prevalence of infidelity.

o. The dominance of religion in the higher institutions of learning.

p. The actual harmony of science and religion; and the origin and nature of the alleged conflict between them.

q. The influence of religious missions on the commerce of the world.

r. The influence of religion on literature and art.

s. The coming unity of mankind in the service of God and of man.

t. That there is an influx from God into the mind of every man, teaching that there is a God and that he should be worshipped and obeyed; and that as the light of the sun is differently received by different objects, so the light of divine revelation is differently received by different minds, and hence arise varieties in the forms of religion.

u. That those who believe in these things may work together for the welfare of mankind, notwithstanding they may differ in the opinions they hold respecting God, His revelation and manifestation; and that such fraternity does not require the surrender of

the points of difference. The Christian believing in the supreme divinity of Christ, may so unite with the Jew who devoutly believes in the Jehovah of Israel; the Quaker with the High Church Episcopalian; the Catholic with the Methodist; the Baptist with the Unitarian, etc."

The immense task of organising the Parliament of Religions was entrusted to a general committee of which the Rev. Dr. John Henry Barrows was appointed the Chairman. This committee consisted of sixteen persons, representing sixteen forms of religious faith. In selecting them, great care was taken to secure as representatives of different religious bodies, persons of strong and vigorous convictions, who would be acknowledged by their respective organisations as worthy to speak in their behalf. The committee, as originally constituted, consisted of the following persons:

Rev. John Henry Barrows, D. D., Chairman (Presbyterian); Rev. Prof. David Swing, Vice Chairman (Independent); Archbishop P. A. Feehan (Catholic); Rt. Rev. Bishop William E. McLaren, D.D., D.C.L. (Protestant Episcopal); Rev. Dr. F. A. Noble (Congregationalist); Rev. Dr. William M. Lawrence (Baptist); Rev. Dr. F. M. Bristol (Methodist); Rabbi E. G. Hirsch (Jew); Rev. Dr. A. J. Canfield (Universalist); Rev. Jenkin Lloyd Jones (Unitarian); Rt. Rev. Bishop C. E. Cheney (Reformed Episcopal); Rev. M. C. Ranseen (Swedish Lutheran); Rev. John Z. Torgersen (Norwegian Lutheran); Rev. J. Berger (German Methodist); Mr. J. W. Plummer (Quaker); Rev. L. P. Mercer (Swedenborgian).

The first public act of this committee was the issuance of the following Preliminary Address, which, being very brief, is here reproduced on account of its historic importance.

"The Columbian Exposition of 1893, besides a comprehensive "and brilliant display of the achievements of men in material pro- "gress, is to be made still more notable by conventions of the lead- "ers of human thought. The Auxiliary having charge of these "congresses is an organisation which has received Congressional "recognition and approval, and is authorised and supported by the "World's Fair authorities, who earnestly believe that these con- "ventions will elevate the character and increase the utility of the

"Exposition. Audience rooms, sufficient in number and capacity "for every kind of assembly, will be provided by the Directory of "the Fair.

"Since the World's Fair stands for the world's progress in civ- "ilisation, it is important that the creative and regulative power of "religion, as a prime factor and force in human development, should "receive due prominence. The committee having charge of the "religious congresses seek the co-operation of the representatives "of all faiths. Now that the nations are being brought into closer "and friendlier relations with each other, the time is apparently "ripe for new manifestations and developments of religious frater- "nity. Humanity, though sundered by oceans and languages, and "widely differing forms of religion, is yet one in need, if not alto- "gether in hope. The literatures and the results of the great his- "toric faiths are more and more studied in the spirit which would "employ only the agencies of light and love. It is not the purpose "of these conventions to create the temper of indifferentism in re- "gard to the important peculiarities distinguishing the religions of "the world, but rather to bring together, in frank and friendly con- "ference, the most eminent men of different faiths, strong in their "personal convictions, who will strive to see and show what are the "supreme truths, and what light religion has to throw upon the "great problems of our age. Ample provision will be made for "special congresses of all churches, denominations, or religious or- "ganisations, which may desire to avail themselves of the oppor- "tunities presented by this auxiliary. The central religious con- "gress will, however, rest on a wider basis. We are confident that "it may be made illustrious as a representative gathering of men "united for the attainment of great moral ends.

"Believing that God is, and that He has not left Himself "without witness; believing that the influence of religion tends to "advance the general welfare, and is the most vital force in the "social order of every people; and convinced that of a truth God "is no respecter of persons, but that in every nation he that feareth "Him and worketh righteousness is accepted of Him, we affection- "ately invite the representative of all faiths to aid us in presenting

"to the world, at the Exposition of 1893, the religious harmonies "and unities of humanity, and also in showing forth the moral and "spiritual agencies which are at the root of human progress. It is "proposed to consider the foundations of religious faith; to review "the triumphs of religion in all ages; to set forth the present state "of religion among the nations and its influence over literature, art, "commerce, government, and the family life; to indicate its power "in promoting temperance and social purity, and its harmony with "true science; to show its dominance in the higher institutions of "learning; to make prominent the value of the weekly rest-day on "religious and other grounds; and to contribute to those forces "which shall bring about the unity of the race in the worship of "God and the service of man. Let representatives from every part "of the globe be interrogated and bidden to declare what they have "to offer or suggest for the world's betterment; what light re-"ligion has to throw upon the labor problem; the educational "questions, and the perplexing social conditions of our time; and "what illumination it can give to the subjects of vital interest that "will come before the other congresses of 1893. It is proposed to "have these and similar themes discussed by great masters of hu-"man thought from many lands, and we invite suggestions and "assurances of co-operation from those persons and religious bodies "to whom this address is particularly sent.

"From the many favorable responses already received from "leading theologians, statesmen, jurists, historians, scientists, "authors, and scholars, it is expected that the congresses of 1893 "will mark an important epoch in the history of the human mind."

There are many reasons for the belief that there is now a wide-spread desire for a more definite and comprehensive knowledge of the exact manner in which the Parliament of Religions was planned and carried into effect, than has hitherto been accessible. Prompted by this belief, the following additional particulars are given, and the final statement of the objects of the Parliament, as settled after a voluminous correspondence, is therefore here reproduced exactly as it was sent to those invited to take part in the convocation.

THE OBJECTS OF THE PARLIAMENT.

1. To bring together in conference, for the first time in history, the leading representatives of the great historic religions of the world.
2. To show to man, in the most impressive way, what and how many important truths the various religions hold and teach in common.
3. To promote and deepen the spirit of human brotherhood among religious men of diverse faiths, through friendly converse and mutual good understanding, while not seeking to foster the temper of indifferentism, and not striving to achieve any formal and outward unity.
4. To set forth, by those most competent to speak, what are deemed the important distinctive truths held and taught by each religion, and by the various chief branches of Christendom.
5. To indicate the impregnable foundations of theism, and the reasons for man's faith in immortality, and thus to unite and strengthen the forces which are adverse to a materialistic philosophy of the universe.
6. To secure from leading scholars, representing the Brahman, Buddhist, Confucian, Parsee, Mohammedan, Jewish, and other faiths, and from representatives of the various churches of Christendom, full and accurate statements of the spiritual and other effects of the religions which they hold upon the literature, art, commerce, government, domestic and social life of the peoples among whom these faiths have prevailed.
7. To inquire what light each religion has afforded, or may afford, to the other religions of the world.
8. To set forth, for permanent record to be published to the world, an accurate and authoritative account of the present condition and outlook of religion among the leading nations of the earth.
9. To discover, from competent men, what light religion has thrown on the great problems of the present age, especially the

important questions connected with temperance, labor, education, wealth, and poverty.

10. To bring the nations of the earth into a more friendly fellowship, in the hope of securing permanent international peace."

In connexion with these objects certain specific rules and regulations were promulgated for the conduct of the proposed conference, the most important of which are as follows:

"1. Those taking part in the Parliament are to conform to the limitations and directions of the general committee on Religious Congresses of the World's Congress Auxiliary, and they are carefully to observe the spirit and principles set forth in the preliminary address of this committee.

2. The speakers accepting the invitation of the general committee, will state their own beliefs and the reasons for them with the greatest frankness, without, however, employing unfriendly criticism of other faiths.

3. The Parliament is to be made a grand international assembly for mutual conference, fellowship, and information, and not for controversy, for worship, for the counting of votes, or for the passing of resolutions.

4. The proceedings of the Parliament will be conducted in the English language.

5. Preceding the meetings of the Parliament will be daily morning conferences, purely religious and devotional, under suitable leaders, thus enabling those naturally affiliated to worship together.

6. The evening meetings will be devoted partly to the practical problems of the age, partly to the meetings of non-Christian religionists who may desire to confer together, and partly to the sessions of the Parliament of Christendom, at which all those who recognise the moral and spiritual leadership of Jesus will discuss the relationship of all believers in Him to one another and to the needs of the world."

These special provisions were supplemented and reinforced by the general rules and regulations of the World's Congress Auxiliary, which were sent through the Department of State, and otherwise, to

all parts of the world. From these rules and regulations the following extracts are here given to show the actual working machinery under which even congresses on labor and religion were conducted with such order, decorum, peace, and success, as were never surpassed, and probably never equalled.

THEMES, SPEAKERS, AND LIMITATIONS.

On these subjects we said:

"To make the proceedings of the various congresses as worthy "of a world-wide publication as possible; to reduce as far as prac- "ticable the expense of such publication; to prevent repetitions of "matter and duplicate assignments of speakers; to secure such a "strength and force of treatment as will ensure the widest reading; "to guard against encroachments by one speaker on the time which "justly belongs to another; and to secure a just representation of "all the participating countries, the themes to be presented in the "various congresses will be selected with a view to make a com- "plete and orderly treatment of the general subject embraced in "the department; the programmes of the different departments "and divisions will be carefully compared, and all papers and re- "marks will be strictly limited to an allotted time. The object will "be to state results and present existing problems and suggested "remedies, and for this purpose lengthy papers are neither neces- "sary nor desirable."

DISCUSSION OF THE SUBJECTS PRESENTED.

"Unprepared discussion or miscellaneous debate would ob- "viously be inconsistent with a plan of which the chief object is to "procure the maturest thought of the world on all the great ques- "tions of the age, in a form best adapted to universal publication. "The time at disposal after the delivery of a discourse will, there- "fore, be given to the most eminent persons present, who will speak "on the call of the presiding officer, and to whom such previous no- "tice as may be practicable will be given. The summaries of pro- "gress to be presented, and the problems of the age to be stated in "the World's Congresses of 1893, will not be submitted to the vote

"of those who may happen to be present, but will be offered for "subsequent deliberate examination by the enlightened minds of "all countries; for unrestricted discussion in the forum, the pulpit, "and the public press; and finally for the impartial judgment of "that exalted public opinion which expresses the consensus of such "minds. With this end in view, remarks of leaders, in elucidation "of a subject, will take the place of ordinary debate. Appropriate "volunteer papers of special merit will be received by the commit- "tees, and given such place in the proceedings as the circumstances "may allow.

"The object of the congresses is not to attempt the impossi- "bility of settling anything by debate during the Exposition season, "but to elicit from the leaders of progress in all countries, convened "in fraternal assembly, the wisest and best thought of the age on "the living questions of our time, and the means by which further "progress may be made.

"*Controversy is excluded from the World's Congresses of 1893.* "Advocates will present their own views, not attack the views of "others."

These rules are given thus explicitly because any extension of the work, to be successful, should be carried forward under substantially the same regulations. By far, the most important of all these rules and regulations was that which excluded controversy and prohibited strife. Each representative was asked to present the very best things he could offer for those in whose behalf he spoke, and was admonished that nothing was desired from him in the way of attack on any other person, system, or creed. There is no more malignant enemy of human progress; there is no worse obstacle to the peace and prosperity of the world, than that vindictive spirit which finds delight in assailing others instead of presenting something meritorious of its own. The rigorous exclusion of this spirit from the Parliament of Religions made its success possible. As has often been stated, the violations of this wholesome rule were so few that in the language of one of the Orientals, the few notes of discord heard only served to make the general harmony sweeter. We asked the Parsee to refrain from charging the religion of Jesus

with the tortures of the Inquisition; the Universalist from taunting the Calvinist with the dogma of infant damnation; and the Quaker from assaulting the Episcopalian for what the former might deem an excess of rites and ceremonies. And we also separated most distinctly from the faith of every religion, any pernicious practices which had grown up through the declining centuries and claimed protection under its name.

At the opening of the first session of the Parliament of Religions on September 11, 1893, it was officially declared in the President's address that:

"In this Congress the word 'religion' means the love and wor-
"ship of God and the love and service of man. We believe the
"Scripture that of a truth God is no respecter of persons, but that
"in every nation he that feareth God and worketh righteousness is
"accepted of Him. We come together in mutual confidence and
"respect, without the least surrender or compromise of anything
"which we respectively believe to be truth or duty, and with the
"hope that mutual acquaintance and a free and sincere interchange
"of views on the great questions of eternal life and human conduct
"will be mutually beneficial.

"It was also declared that while the members of this Congress
"meet, as men, on a common ground of perfect equality, the ec-
"clesiastical rank of each, in his own church, is at the same time
"gladly recognised and respected, as the just acknowledgment of
"his services and attainments. But no attempt is here made to
"treat all religions as of equal merit. Any such idea is expressly
"disclaimed. In this Congress, each system of religion stands by
"itself in its own perfect integrity, uncompromised, in any degree,
"by its relation to any other. In the language of the preliminary
"publication of the department of religion, we seek in this Congress
"to unite all religion against all irreligion; to make the Golden
"Rule the basis of this union; and to present to the world the sub-
"stantial unity of many religions in the good deeds of the righteous
"life. Without controversy, or any attempt to pronounce judgment
"upon any matter of faith or worship or religious opinion, we seek
"a better knowledge of the religious condition of all mankind, with

"an earnest desire to be useful to each other, and to all who love "truth and righteousness."

Attention was also called to the fact that "the religious faiths "of the world have most seriously misunderstood and misjudged "each other, from the use of words in meanings radically different "from those which they were intended to bear, and from a disre- "gard of the distinctions between appearances and facts; between "signs and symbols and the things signified and represented."

As we said in the opening address to the Parliament: "The "programme for the religious congresses of 1893, constitutes what "may, with perfect propriety, be designated as one of the most re- "markable publications of the century. The programme of this "general Parliament of Religions directly represents England, Scot- "land, Sweden, Switzerland, France, Germany, Turkey, Greece, "Egypt, Syria, India, Japan, China, Ceylon, New Zealand, Brazil, "Canada, and the American States, and indirectly includes many "other countries. This remarkable programme presents, among "other great themes to be considered in this Congress, Theism, Ju- "daism, Mohammedanism, Hinduism, Buddhism, Taoism, Con- "fucianism, Shintoism, Zoroastrianism, Catholicism, the Greek "Church, Protestantism in many forms, and also refers to the na- "ture and influence of other religious systems."

This programme also announces for presentation the great subjects of "revelation, immortality, the incarnation of God, the uni- "versal elements in religion, the ethical unity of different religious "systems, the relations of religion to morals, marriage, education, "science, philosophy, evolution, music, labor, government, peace, "war, and many other themes of absorbing interest."

How magnificently this great programme was executed; with what awe inspiring scenes it was attended, cannot be told within the compass of any magazine article. The sublime events of the seventeen days which embraced the work of the Parliament, are set forth in Dr. Barrows's admirable history of the great convocation, and in numerous other publications in which different writers have endeavored to reproduce the occurrences of September, 1893. Suffice it here to say that the anticipations, both of those who had or-

ganised the work, and of those who participated in its execution, were far more than realised. Looking back upon the Parliament after this lapse of time, it still seems almost incredible that such wonderful harmony should have been secured, with such a vigorous, thorough, and far-reaching treatment of the great themes set down for consideration.

Only the briefest reference can be made in this paper to the judgment pronounced by many illustrious leaders on the Parliament of Religions and its work. A volume would not suffice to contain them all. The few extracts given below are chosen rather from orthodox than from liberal sources.

The Independent, a leading organ of Christian thought, says of those who took part in the Parliament of Religions, that they conconstitute "the most remarkable group of leaders, thinkers, and "representative persons who could possibly be brought forward to "make an exposition of every possible phase of anything now in "the world which is fit to be called rational religion, in any sense. "It was one of the boldest steps ever taken in the religious history "of this world, when a few Christian believers conceived the plan "of thus bringing together representatives of all the religions of the "globe, and giving the globe an opportunity to hear what they had "to say for themselves in comparison with each other, and in com-"parison with Christianity. It was a noble act of faith and showed "a Christian confidence which was more than justified in the result, "as the history of the Parliament before us shows."

Emilo Castelar, the Spanish Republican Catholic orator and statesman, says: "If the reports of the Congress were not verified "by so many American and European journals which contain exact "minutes of its sessions, it would seem to us merely the imagining "of some poet's fancy, bent on bringing before our vision the year "three thousand, or of some theorising philosopher confident of the "realisation of his humanitarian Utopias and optimistic hopes. The "logical deduction from all that happened on that notable occasion "is that all the religions there assembled found a common ground "in Christianity; all that were posterior to it followed in its foot-"steps, and all that were anterior to it prepared the way for it,

"whether they would or no. How clearly it appears in such a re-
"union of the churches that Christianity is at once a revealed and
"a natural religion. Our religion is a great reservoir which has re-
"ceived the current of four great tributaries—the Books of the Ve-
"das, of the Zend-Avesta, of the Synagogue, and of Greek learning;
"by reason of which it has a synthetic and universal character,
"which makes it a final and perennial religion for all mankind."

Rev. Dr. George Dana Boardman, the distinguished Baptist preacher and theologian, says: "The World's Congresses were the "crown of the Exposition. The Parliament of Religions was the "diamond in the crown. There the intellectuality and there the "spirituality culminated. The Parliament of Religions! It was "seventeen days in session; there were three sessions each day; "one hundred and seventy papers were read. These sessions were "thronged, the total attendance being estimated at about one hun-"dred and fifty thousand. Glorious as was Jackson Park, with all "its manifold and magnificent tokens of human art and industry "and science, the Parliament of Religions was, to the thoughtful, "more attractive even than Jackson Park.

"The spirit of the Parliament was not one of curiosity, or ex-"hibition, or seizure of opportunity to express loose views. That "spirit was the spirit of a serious, solemn anxiety. Earnest men "and women were there. Accordingly the Parliament was marked "by courage. I never heard braver men speak. At the same time "there was a beautiful spirit of courtesy. We listened to each "other with profound respect, as becomes men made in the image "of God, who are to meet each other at the judgment-seat of Jesus "Christ."

Rev. Dr. F. A. Noble, orthodox Congregationalist, says, in *The Advance*, one of the leading organs of that church: "The Par-"liament of Religions was inevitable. In one form or another, "sooner or later, it was sure to come. With the interest which has "been taken in the study of comparative religions for the last quar-"ter of a century, and which is deepening every day, and with the "increasing facilities for intercourse between all the ends of the "earth, and above all, under the impulse given to the subject by

"the aggressive activity of modern missionaries, it was simply a "matter of course that the adherents of the different faiths of the "world should somewhere, sometime, come together, and take each "other by the hand, and look each other in the face, and talk over "the grounds of their beliefs, and compare spirit and aims, and see "which by the test of fruits is the most worthy of universal accep- "tance."

Rev. Dr. George Washburn, President of Robert College, Constantinople, Turkey, thinks it "a strange and unaccountable mis- "conception of the Parliament to suppose that the Master of Chris- "tianity was wounded there. The religious brotherhood which was "recognised at Chicago was the same brotherhood which St. Paul "recognised at Athens, the same which every missionary must rec- "ognise before he can gain a hearing with those who have a faith "of their own. No missionary ever made a convert by avoiding "him, refusing to listen to him, or cursing his religion. If I wish "to reveal Christ to a man, I must not only treat him as a brother, "but feel that he is a brother, and find some common ground of "sympathy. This was what was attempted on a grand scale at "Chicago."

Prof. George E. Post, of the Christian College in Beirut, writing of the Parliament, says: "We proved that true religion is, al- "ways was, and always will be, one. Moslems claim that Adam, "Noah, Abraham, Job, David, Solomon, Mohammed, and Christ "were Moslems. I claim that every saved soul was and is a Chris- "tian. The name is nothing, the fact is everything. Abraham was "saved when he was Abram, in uncircumcision. Isaiah did not "know who the Wonderful and Counsellor was. David did not "discern his greater Son. Socrates did not understand the drift of "his own aspirations. Cornelius, as I firmly believe, was a devout "heathen. I believe that we can go to every son of Adam and "preach boldly the basic principles of our religion, satisfied that "down in the depths of his heart there is a response, and that he "must admit what we say, if it is rightly put, or as his own stan- "dard commands him, because it is contained in ours. If there

"were not a response, we should waste breath in our presentation "of the cause."

The New York Evangelist published several articles on the Parliament of Religions, including one by the Rev. Dr. Henry B. Jessup, of Beirut, Syria, in which he says: "In the Parliament of Re- "ligions, Christianity was the hostess of the nations. She welcomed "men of all faiths to come and see what the religion of the Bible "can do for the individual, for society, and the world. She said to "all, bring your best and your wisest men, and we will hear them "courteously and patiently. The moral impression of such a scene "was prodigious, and it will be lasting. We all need to know more "of what non-Christian people think of us, that we may better un- "derstand them. It was wise to inaugurate such a congress during "the Columbian Fair, that the spiritual element might rise supreme "above the material. The spiritual has certainly proved the more "vital and enduring, and will so continue when the material glory "is forgotten."

But the space now at disposal forbids that these extracts be here extended.

* * *

Even before the World's Parliament of Religions was closed, a movement was almost spontaneously made for an extension of its beneficent and far-reaching influences. Preliminary committees were appointed and several meetings held with that end in view, and it was decided that the attempt should be made to extend the enthusiasm and blessing of this unprecedented reunion of men of all kinds of faith who had gathered at Chicago from all quarters of the globe—an event which proved a Pentecost, and, in wide circles, awakened a powerful religious revival. It was agreed that the name of the organisation should be "THE WORLD'S RELIGIOUS PARLIAMENT EXTENSION," and as a motto the word of Isaiah i, 18, was adopted: "*Come now, and let us reason together, saith the Lord.*"

Of the Local Committee, Dr. Frank M. Bristol, of the Methodist Church of Evanston, Ill., is the Chairman, and Dr. Paul Carus, Editor of *The Monist*, is the Secretary. Of the Associate Committee

of women, Mrs. Elizabeth Boynton Harbert is Chairman, and Mrs. Frederick Hawkins, Secretary.

A declaration of the aims and principles of the World's Religious Parliament Extension, which should serve to characterise the spirit of the organisation and indicate the line of work which it should follow, was approved of after a careful consideration by men of widely different religious convictions. This declaration reads as follows:

"The World's Religious Parliament Extension has been called "into existence by the interest that was aroused through the Par- "liament of Religions, and is destined to continue the work so au- "spiciously begun. The movement is a symptom of the broaden- "ing spirit which is perceptible everywhere, in our understanding "not less than in our sympathies.

"The purpose of the organisation shall be:

"1. To promote harmonious personal relations, and a mutual "understanding between adherents of the various faiths;

"2. To awaken a living interest in religious problems; and "above all—

"3. To facilitate the attainment and actualisation of religious "truth.

"The World's Religious Parliament Extension is intended for "the liberals as well as the orthodox; for both the Christians and "Jews of the Occident, and the Brahmans and Buddhists of the "Orient; and it will be broad enough to include all shades of belief "without asking any surrender or compromise; its service to man- "kind will be to bring home to men the indispensability of religion, "to ascertain the truth whatever it may be, and help others to see "the truth. This is to be done, not by sensational and not by sen- "timental methods, but by a patient collection and collation of facts, "and by judicious investigation.

"If the success of an undertaking depends upon the need of "the work which it proposes to perform, we may rest assured that "the World's Religious Parliament Extension will become a great "and important movement.

"We trust that the age in which we live is not, as is often as-

"sumed, irreligious, but more intensely religious than any previous "age. There is only this difference, that the religious aspirations "of to-day are more comprehensive, more liberal, more cosmic, and "in a more conscious co-operation with science than before.

"The committee has received encouragement from Christians "of the most important denominations, from Brahmans, Buddhists, "and others. Especially have the Orientals shown themselves "willing to investigate the religious problem, and hear with an open "and impartial mind what others have to say upon it.

"The committee recommend to all religious organisations in "Christian and non-Christian countries, the holding of meetings "devoted to the aims of the World's Religious Parliament Exten- "sion; to invite men of different faiths; to listen to their presenta- "tion; and to discuss the differences in a brotherly and unpreju- "diced manner. Let our churches set the example to the Moham- "medans, Brahmans, and Buddhists, and let us by all means en- "courage their search after the truth."

Subsequent events have abundantly shown that this extension movement was simply a necessity. It has been pressing for progress ever since the close of the World's Congress season. Instead of urging it forward, the President of the Congresses and the Chairman of the Parliament of Religions have rather held the movement back. This they have done, not from any want of sympathy with it, but as a reasonable safeguard against action stimulated merely by the enthusiasm engendered by the Parliament; and also to secure time for rest and recuperation after the arduous labors of 1893. But I think we are all now satisfied that the demand for an organised and efficient extension of the work and influence of the Parliament of Religions is so general and so earnest that it has become a matter of duty to respond to that demand, and to endeavor to supply it, as far as may be found practicable. Several instances of spontaneous movements in different localities for the purpose of such extension have come to the knowledge of the committee.

The formal inauguration of the World's Congress Extension work was, therefore, made a conspicuous feature of the Reunion and Celebration on last New Year Day. But it has not been thought

wise to confine the extension work to the department of religion alone. At the close of the World's Congress season, a proclamation was made, declaring the continuation of the World's Congress organisation for fraternal and historic purposes, and for the performance of such work as could not otherwise better be done. Accordingly, the Celebration was made, in a general way, representative of the whole scope of the World's Congress work, and encouragement given for the holding, not of religious meetings only, but also of similar gatherings for the purpose of promoting a like extension in other departments, including literature, science, art, industry, philanthropy, etc.

The formation of world-wide fraternities to continue the work planned for the World's Congresses of 1893 was announced as one of the original purposes of the World's Congress scheme. For it is not in religion only, but in all the other departments of civilised life, that there is need of a larger fraternity and co-operation than has hitherto been known. We earnestly sought and still desire to remove, as far as possible, the barriers of race, country, religion, custom, and the like, in order that, as was declared in the opening address at the first session of the Congresses, he who in any part of the world follows the path of duty may feel that he has the sympathy and encouragement of those who in every other part of the world are engaged in the same pursuit.

Not only the Parliament of Religions, but the entire World's Congress scheme was conceived and executed ; and we now seek to extend their benign results wherever occasion may require or opportunity offer, in the spirit of that divine charity which "suffereth long and is kind, which envieth not, which vaunteth not itself, which is not puffed up, which doth not behave itself unseemly, which seeketh not its own, which is not easily provoked, which thinketh no evil, which beareth all things, which believeth all things, which hopeth all things, which endureth all things, which never faileth." (1 Cor. 13.)

In the spirit of this charity, we earnestly solicit the co-operation of the leaders of intelligence and virtue in all countries, to continue and carry forward into more full and fruitful effect, in their

respective localities, the objects and purposes of the World's Parliament of Religions and the other World's Congresses of 1893.

Any member of the Advisory Council of the World's Parliament of Religions, or any person who took part in the Parliament, may, in his own place, in any part of the world, in connexion with such other members or participants, if any, as may desire to co-operate with him, make the necessary arrangements for a meeting, or a series of meetings to extend the work and influence of the Parliament of Religions, substantially conforming to the principles, rules, and regulations which are above set forth. In localities where no such member or participant resides, any representative of any religious faith may take the initiative and call a meeting for the appointment of a local committee to conduct the proposed Religious Extension movement. The president and secretary of every such meeting, wherever held, are requested to send an account of the proceedings, without unnecessary delay, to the editor of *The Monist*, as Secretary of the Chicago Extension Committee.

Any member of the Advisory Council of any other of the World's Congresses of 1893, or any member of any committee of co-operation in such congress, or, in the absence of any such member, any representative of the work of such congress may take similar action to bring about meetings for a similar extension.

The Parliament of Religions will live. Its influence will endure, and will extend throughout the world. It will finally accomplish its high mission to unite all religion against all irreligion; and make the Golden Rule the law of religious association and intercourse. Under that divine rule, mankind will realise, as never before, the truth that "all religion has relation to life, and the life of religion is to do good."

We are not only deeply grateful to all who contributed to the marvellous triumphs of the World's First Parliament of Religions, but we also thank even those who have censured, because they misunderstood its noble work. For, though unwittingly, they also have served the sacred cause. Their criticisms have attracted larger attention, excited increased interest, and stimulated more thorough

investigation, and may thus prove, in the end, even more serviceable than their co-operation and commendation would have been.

The summer of religious peace will, indeed, not come in a day, but it is approaching more rapidly than can well be realised. The echoes of the Parliament of Religions will not cease, but will multiply a myriadfold in all the continents, adding their music to the morning prayer and the evening supplication of devout and hopeful hearts, and, preparing the way for a wider reign of peace, progress, and happiness than the world has hitherto known.

A few words from a summary of the *Results of the Parliament of Religions*, by the Rev. Dr. John Henry Barrows, whose masterly work in the organisation of the Parliament deserves and has commanded the highest praise, may well close the present paper. He says:

"It was the spirit of fraternity in the heart of America which succeeded in bringing together such widely separated exponents of religion. 'Enemies simply met and discovered that they were brothers who had one Father in Heaven.' To speak of the deep, tender feelings awakened by the presence, at the Parliament, of the truthseekers of the Orient, earnest, heart-hungry, believing they had much to teach as well as something to learn; their 'faces set toward God, and with some message from God': to recall the emotions awakened during the great opening and closing hours of the Parliament, would be to indulge in what many would deem a sentimental rhapsody; but it is not rhapsody to say that 'the age of isolation has passed, and the age of toleration and scientific comparison has come.'"

Let the grand work so auspiciously inaugurated at Chicago in 1893 go forward in renewed efforts, until all the world shall respond to its benign and gracious spirit; and the pure and noble peace it both prophesied and exemplified in the Parliament of Religions shall prevail among all the peoples of the earth, exalting, not only their religious, but at the same time their personal, social, business, and political life. This is the mission of the World's Religious Parliament Extension.

CHARLES C. BONNEY, LL.D.,
President World's Congresses of 1893.

CHICAGO, ILL.

THE WORLD'S RELIGIOUS PARLIAMENT EXTENSION.

EMERSON, our great poet-philosopher, has said: "America, thy name is opportunity!" And, indeed, here is the place to realise ideals which appear to be impracticable in Europe. The New World is like a new dispensation with new possibilities for a higher, nobler, and grander covenant. What was left undone in Benares, the centre of an old civilisation, in Jerusalem, a city sacred to three great religions, in Rome the venerable see of the Popes, and in London the home of modern science and industry, has been accomplished by the bold spirit of Chicago enterprise. A parliament of all the religions of the world, always regarded as a vague dream, has become an actual fact of history, the importance of which can hardly be overrated, for it will more and more be recognised as a landmark in the evolution of religion. But the duty devolves on us to utilise its blessing, to extend it to the whole world, and to make it a permanent factor for good in the future development of mankind. For this purpose the World's Religious Parliament Extension has been founded, in which it is proposed to establish friendly relations among all religions for a better mutual understanding, to awaken all over the world a lively interest in religious problems, and above all to facilitate the final and universal attainment of religious truth.

The significance of the World's Religious Parliament Extension is not merely local. All over the world, there are men who are serious in their religious convictions, who not only want the truth as they see it recognised by their brethren, but also desire to under-

stand the meaning of others with whom they disagree and are anxious to grow in both their comprehension of the truth and their sympathy for all honest inquirers. At the New Year's reunion, when, on the occasion of a celebration of the world's congresses, the World's Religious Parliament Extension was inaugurated, we witnessed at the Auditorium, the largest theatre of Chicago, a stately gathering of thousands of eager people who had come to listen to the speeches of the best known ministers of the city and its vicinity; and greetings were read from prominent religious leaders representing the greatest denominations and most important religious aspirations of mankind.

We here present some of the messages received, and let them speak for themselves.

GREETINGS FROM ROMAN CATHOLIC PRELATES.

Cardinal Gibbons writes to the Hon. C. C. Bonney:

"I regret very much that I must deny myself the pleasure of "participating in the meeting to commemorate the 'World's First "Parliament of Religions.'

"My official duties render it impossible for me to leave home "at this time.

"I take this occasion to tender you my sincere and cordial con- "gratulations on the success of the 'World's Fair Auxiliary,' and "I have reason to hope that the results of this Congress, in which "you took so prominent a part, will be long-enduring and far- "reaching."

A telegram from Archbishop Ireland:

"Happy New Year to my friends of the World's Congress Aux- "iliary. You do well to perpetuate the memory and extend the in- "fluence of the great work of 1893. It was a marvellous work, "leaving its deep ineffaceable mark in the world of thought and pro- "gress."

LETTERS OF SYMPATHY FROM BUDDHISTS.

H. Dharmapála, editor of the *Maha-bodhi Journal*, Calcutta, India, a representative of Ceylonese Buddhism, writes:

"The scene of last summer often comes into vividness, and

"then I see the panoramic picture of the brilliant gathering, the "joyful faces, the cordial shaking of hands, the meeting-hall, and "the welcoming of delegates. The spirit that animated me to take "part in the deliberations of the Parliament of Religions still urges "me on, and I know that if you will persevere in building up the "superstructure on the bases of love and compassion laid by the "late Parliament, you will succeed. The world needed a friendly "assemblage and the Parliament was the result. The great evils "that afflict mankind have to be combated, and who will do this "but the free and democratic people of America?

"If your Government would take action upon your suggestion "to print the proceedings of the several Congresses, it would be "splendid, indeed. Such a mass of knowledge could never again "be collected. I hope your suggestion will be carried out by the "American Government. The sympathy of millions of people is "with you, and that is enough to keep you safe and strong."

Shaku Soyen, a Buddhist High Priest of the Zen Sect, Kamakura, Japan, writes:

"I deeply sympathise with the plan of continuing the work of "the Parliament of Religions. It appears to me that the present "age is a period in which a religious reform is preparing itself all "over the world, and it is our duty to investigate the truth with "impartiality, so that its light may shine brighter than before. "Some narrow-minded persons imagine that they can suppress "the universal aspiration that called the late World's Religious "Parliament into existence, which is the greatest spiritual event of "our age. But they will not succeed, and I hail the movement of "the Religious Parliament Extension which you have started. It "is a new proof that progress cannot be checked. We have to fight "a religious battle against superstitions and narrowness by taking "the spirit of science and philosophy as shield, and the principle of "universal brotherhood as sword. The distinction between Chris-"tianity, Mohammedanism, and Buddhism should not be made be-"fore the altar of truth, and we should be open-minded enough not "to exaggerate the importance of the differences which exist be-"tween races, rituals, and languages. I sincerely hope that your

"movement will be successful so as to unite the religions of the "world and lead them to the recognition of the truth."

Zitsuzen Ashitsu, of Hieisan, Omi, Japan, a Buddhist priest representing the Tendai Sect, writes:

"That the Parliament of Religions as undertaken by Western "energy and religiosity has proved a great success and produced "good results by dispersing the prejudices of narrow-minded people "both in the East and in the West, by revealing the fundamental "truths which are common to every religion, by explaining the "foundation upon which alone man can find peace of soul and enter "eventually into the life eternal of bliss, and by setting forth the "ultimate ground of the religious unity of the world, is now fully "established, not only in the opinion of the people at large, but "also, and especially, by all scholars of prominence. These are "important facts which we should always bear in mind.

"I am very glad to learn that you have founded an organisation "under the name of 'Religious Parliament Extension,' which will "pursue the noble and good principles of the Parliament of Reli- "gions. It is a Buddhistic idea that 'truth is but one, while its "dress may be different,' and, so far as I can, I heartily wish to co- "operate with you."

MESSAGES FROM ORTHODOX PROTESTANTS.

Bishop Benjamin W. Arnett of the African Methodist Episcopal Church writes:

"I am with you and the Committee heart and soul, and I hope "that there will be a Parliament of Religions in every land, so that "mankind may feel as we felt, and see as we saw at Chicago."

The Rev. Joseph Cook writes:

"My watchword for the World's Congress Reunion Extension "and Celebration at the Auditorium, January 1, is:

"*Via Lucis, Via Crucis*, the way of light is the way of the "Cross. Upward, Onward, Heavenward!

"The echoes of the Parliament of Religions of 1893 have been "world-wide, and will endure for generations.

"These responses already prove that vital and enlightened or-

"thodoxy ought to rejoice in the general result of a wholly unprece-
"dented assembly, which represented the religions of more than
"half of the human race, and opened all of its sessions with the
"Lord's Prayer.

"The Parliament must be judged by its official record, edited
"by its Chairman, the Rev. Dr. John Henry Barrows, and not by any
"or all of the very numerous fragmentary and distorted reports of
"it, which have misled portions of the public, at home and abroad.

"It was officially stated in the Parliament, at the outset, by
"both President Bonney and Dr. Barrows, that the equality among
"religions guaranteed in the meetings was parliamentary and not
"doctrinal. No speaker understood himself to be making doctrinal
"concessions of any kind. Every historic form of religious faith
"was guaranteed a fair hearing. All non-Christian faiths now stand
"face to face with Christianity, and are, many of them, being pro-
"foundly modified by this contact. The pretences of several alien
"faiths are a part of their defences. It is important that the former
"should be understood, if the latter are to be overthrown.

"Many distinguished Christian missionaries not only took part
"in the Parliament, but, after a year's study of its results, have
"recognised the immense value of its proceedings and official litera-
"ture, in exhibiting to non-Christian nations the difference between
"real and nominal Christianity, and the substantial unity of evan-
"gelical Christendom in the essentials of religious doctrine and life,
"in spite of diversities in denominations and polity.

"Christianity of the scholarly, Biblical, and aggressive type
"stood forth in the World's Parliament of Religions among non-
"Christian faiths and philosophies as the *sun among candles*. And
"this incomparable pre-eminence it can never henceforth fail to
"have among all intelligent, devout, and conscientious students of
"the self-revelations of God in human nature and history."

PROPOSITIONS OF A CHRISTIAN MISSIONARY.

The Rev. George T. Candlin of Tientsin, China, writes:

"Since my visit to Chicago I have thought much on the old
"subject, religious union, how it can be promoted, and how the

"grand object of the Parliament, as I conceived it, can be realised. "The more I think the more clearly I perceive how tremendous the "barriers are and how seemingly unyielding. Without such stimu- "lus as the Parliament of Religions has afforded me, I should find "myself *simply unable to believe in the possibility of union.* But noth- "ing can shake my confidence that the historic and consecrated "gathering in Chicago was the herald of a great spiritual movement, "and that the fire it has kindled will not be blown out till the refin- "ing and fusing mission is complete. The point of interest on "which I concentrate my attention is the relation of Christian to "non-Christian faiths. This I take to be the very gist and *crux* of "the missionary problem *in the world of thought.* The question of "union *within* the Christian Church may be left for the Church in "Christian lands to work out. I regard that, stupendous as the "changes involved will be, as a foregone conclusion. The forces "which will bring it to a triumphant issue are already in operation "and act with ever-accelerating effect. The attitude which Chris- "tians must assume to non-Christian faiths, and the feeling towards "Christianity to be promoted amongst non-Christians is peculiarly "the missionary's problem. This the great body of home-Chris- "tians are not in a position to solve. The solution is yet far off, "and it will be a terrible business to get through. But had the "Parliament of Religions any lower or less comprehensive ideal "than this—the complete reconcilement of religious belief through- "out the world? The question of questions then is what, precisely, "can we do to promote it? What steps which will put us a little "nearer the ideal, if only a few feet nearer, are practicable now? "This is where our sincerity will be put to the test, when we pass "from sentiment to action. To attempt too much will be to accom- "plish nothing. To attempt no action will be to leave the ideal a "beautiful but unsubstantial dream, fading ever into the dimness of "unreality.

"Nay, if it be—alas—
"A vision, let us sleep and dream it true!
"Or—sane, and broad-awake,
"For its great sound and sake,
"Take it, and make it earth's, and peace ensue.

"Now in the attempt to say what can be done, I am guided "entirely by the analogy of that development which has already "taken place in the direction of union amongst Christians. We now "hear on all hands direct proposals for union amongst various sec- "tions of Christians. These proposals were not possible so late as "half a century ago. Why? Because a prior state of mutual re- "gard and respect had not been established. Christians of differ- "ing beliefs simply used to damn each other. Then union was "impossible, and every one who proposed it was considered as irre- "ligious as he was crazy. But as soon as they reached the stage "where they honestly gave one another credit for good intentions, "instead of calling one another emissaries of Satan, the spirit of "tolerance prevailed, and together with a recognition of the com- "parative insignificance which lay in differences of creed, grew up "a genuine consciousness of their common hold upon the truth. "This is where Christians, many without quite knowing it, stand "to-day. The old names, Catholic, Protestant, Anglican, Dissen- "ter, Baptist, Methodist, Independent, Calvinist, Armenian, have "lost their spell, and we know that as true and as lovely exhibitions "of Christian character are developed under one form of faith as "under another. How sane and healthy all this is. We at once "see the good in such, understand the meaning of each; and, what "is better, each begins to awake to a sense of its own limitations. "We are now in sight of the goal, for we see that whatever becomes "of *the names*, union will come by conserving and promoting all that "is true and good in each.

"Now some such process must be attempted on the wider field "of general religious union. Our present aim must be to get the mu- "tual *tolerance* which subsists already between the sections of Chris- "tendom. We must begin by giving one another credit for good "intentions. I do not see why we may not commence at once by "the leading representatives of the various faiths who were present "at Chicago, including all the distinguished representatives of "Christianity, with Mr. Mozoomdar, Mr. Dharmapála, Mr. Vive- "kananda, Mr. Ghandi, the Buddhists of Japan, the high priest of

"Shintoism, and our friend Mr. Pung entering into direct covenant "with each other:

"1. Personally never to speak slightingly of the religious faith "of one another. This I understand does not debar the kindly and "reverential discussion of differences which exist, or the frank utter- "ance of individual belief.

"2. Officially to promote among their partisans, by all means "in their power, by oral teaching through the press, and by what- "ever opportunity God may give them, a like spirit of brotherly re- "gard and honest respect for the beliefs of others.

"3. To discourage amongst the various peoples they serve as "religious guides, all such practices and ceremonies as *not consti-* "*tuting an essential part of their faith*, are inimical to its purity and "are the strongest barriers to union.

"4. To promote all such measures as will advance reform, pro- "gress and enlightenment, political liberty and social improvement "among the people of their own faith and nationality.

"5. To regard it as part of their holiest work on earth to enlist "all men of ability and influence with whom they are brought into "contact in the same noble cause.

"To these articles I can heartily subscribe myself. I do not "see why others may not. I am sure you can subscribe to them, "and Dr. Barrows, and Dr. Momerie, and Dr. Hawies, and the Rev. "Lyman Abbott, and Rabbi Hirsch, and Dr. Boardman. I am "sure that Mr. Mozoomdar can, for I have been reading his Orien- "tal Christ, and I find the Brahmo-Somaj put forth such principles "long ago. I hope he will not denounce me as a plagiarist. I "think Mr. Dharmapála ought, and Mr Vivekananda, and Mr. "Ghandi, and Mr. Pung, and the others.

"The result within our own lifetime from united action of this "kind, on the part of those of us who had the priceless privilege of "coming together in council last year from all parts of the world— "a 'band of brothers'—would be incalculable. All over the world "man would be crying to his fellow-man in cheery tones of brother- "hood, and answering echoes of love and the holy name of religion, "no longer prostituted as a divine sanction to metaphysical wran-

"gles, would represent everything that binds men's hearts in holi-
"ness, and everything that opposes sin and selfishness.

"In the name of all that was greatest in the Parliament of Re-
"ligions, the common ties and common aspirations of humanity
"which it represented; in the name of whatever in it was most
"prophetic of the future, I ask you, our noble President, you who
"have the warm love and unstinted confidence of us all.—Why may
"we not do it?"

* * *

It is to be hoped that the World's Religious Parliament Extension will contribute toward that common ideal of all religious minds which will at last unite mankind in one faith and prepare the establishment of a church universal. Rituals and symbols may vary according to taste, historical tradition, and opinion, but the essence of religion can only be one and must remain one and the same among all nations, in all climes, and under all conditions. The sooner mankind recognises it, the better it will be for progress, welfare, and all international relations, for it will bring "glory to God in the highest, and on earth peace toward the men of good-will."

We can see as in a prophetic vision the future of mankind; when the religion of love and good-will has become the dominating spirit that finally determines the legislatures of the nations and regulates their international and home politics. Religion is not for the churches, but the churches are for the world, in which the field of our duties lies. Let us all join the work of extending the bliss of the Religious Parliament. Let us greet not our brethren only, but also those who in sincerity disagree from us, and let us thus prepare a home in our hearts for truth, love, and charity, so that the kingdom of heaven, which is as near at hand now as it was nineteen hundred years ago, may reside within us and become more and more the reformatory power of our public and private life.

EDITOR.

A PIECE OF PATCHWORK.[1]

"I HOLD it to be a cardinal point in this busy world of ours," says Dr. Thring, "that all who are in earnest should help each other, and that every person engaged in life-work should if possible appear at the call of a fellow worker." I am here to address you in response to such call.

You will doubtless remember how much talk there was a few years ago about the best hundred books. Well, I confess that it seems to me that there are just three great books, and that the aim of all our schooling should be to teach our scholars how to read them aright and to act upon their teachings. These three great books are the book of nature, the book of art, and the book of life. I am well aware that this classification is open to criticism. In its broadest acceptation the book of nature—that is if we include human nature (and why should we not include it?)—covers the whole field; while on the other hand the book of life may with equal cogency be said to be all-embracing, since every interpretation of nature and all artistic expression are the products of our life-work. But let us not quarrel over definitions. Let us rather see in what spirit we are to read these books.

First, let us read them for ourselves, not merely hear about them from others. Thus only can we become not only learned but wise. For as Lessing tells us, "Learning is only acquaintanceship with the experience of others; knowledge is our own." Remember that the common-sense which we all prize so highly is the outcome of individual and personal experience. "A handful of common-

[1]An address to teachers. The number of quotations justifies, I think, the title.

sense," says a Spanish proverb, "is worth a bushel of learning." Let us then read for ourselves the book of nature, the book of art, and the book of life, using the opinions of others merely as a commentary thereon.

Secondly, let us read them for our profit and for self-development. Let us never be ashamed of developing even though this involves, as it must involve, many confessions of past imperfection and error. The frog is not ashamed (or presumably would not be, were he self-conscious) of ceasing to be a tadpole; nor the butterfly of having risen above its greedy caterpillar phase of development. So much inconsistency is essential to progress. It was with this in his mind that Emerson said: "Suppose you should contradict yourself; what then? A foolish consistency is the hobgoblin of little minds, adored by little statesmen and philosophers and divines. With consistency a great soul has simply nothing to do." Remember that the inconsistency Emerson speaks of is that which is the outcome of development. Of this inconsistency be nowise ashamed. Lowell was right when he told us: "The foolish and the dead alone never change their opinions."

Thirdly, let us read them not only for our profit but also for our enjoyment. "No pleasure," said Bacon, "is comparable to the standing on the vantage ground of truth."

Fourthly, let us read them with modesty and humility; with a constant salutary sense of our own profound ignorance—yes, even the prize-winners among us. Sir William Temple has here a word in season for us: "Nothing," he says, "keeps a man from knowledge and wisdom like thinking he has both."

And fifthly, let us read them with reverence. "Reverence," says Mr. Frederick Pollock in his work on Spinoza, "will never be wanting from those who study nature with a whole heart; reverence for the truth of things, and for all good work and love of the truth in man." On the other hand: "The scornful spirit," as Mr. Stopford Brooke tells us, "is the blind spirit and the unthoughtful one; and to its blindness nature displays in vain her beauty and man his wonderful life; contempt sees nothing, and seeing nothing has no materials for thought. But he who bends in loving reve-

rence before the beauty and the majesty of the universe, receives its teaching at every pore."

So much for the spirit in which we should read. You will no doubt remark that, with a touch of that inconsistency of which I spoke just now, I am endeavoring to enforce the importance of a first-hand reading for ourselves of the three great unwritten books, through second-hand quotations from written books. But of course you will understand that, in urging you to learn directly of nature and art and life, I would by no means have you disregard the teachings of those who deserve to be heard *just because they themselves have done this very thing*. Let what you read in the written page be but the seed which shall bear fruit in your own mind. As Bulwer Lytton says: "Never think it enough to have solved the problem started by another mind till you have deduced from it a corollary of your own." Depend upon it, Sir Thomas Browne was right when he told us: "They do most by books, who could do much without them."

Let me now pass on to say a few words concerning each of our three great books; and first concerning the book of nature. The direct appeal to nature is for us in England associated with the name of Francis Bacon, who, though he was "weak in science," was "strong in the philosophy which sought its materials in science." He was, as George Henry Lewes said, "rather one who sounded the trumpet-call than one who marshalled the troops." And over his work may be written his own words: "Man, the servant and interpreter of nature, can act and understand no further than he has, by work or contemplation, observed the method of nature."

What, then, are the cardinal teachings of the book of nature? Sir Thomas Browne, the span of whose life overlapped that of Bacon's by some twenty years, shall answer this question. "There is," he says, "no liberty for causes to operate in a loose and straggling way; nor any effect whatsoever but hath its warrant from some universal or superior cause." Or if you would have a more modern answer, let Emerson be called upon to speak: "Man," he tells us, "has learned to weigh the sun, and its weight neither loses nor gains. The path of a star, the moment of an eclipse, can be

determined to the fraction of a second. Well, to him the book of history, the book of love, the lures of passion, and the commandments of duty, are opened: and the next lesson taught, is the continuation of the inflexible law of matter into the subtle kingdom of will, and of thought; that, if in sidereal ages, gravity and projection keep their craft, and the ball never loses its way in its wild path through space—a secreter gravitation, a secreter projection, rule not less tyrannically in human history, and keep the balance of power from age to age unbroken. Religion or worship in the attitude of those who see this unity, intimacy, and sincerity; who see that, against all appearances, the nature of things works for truth and right forever." Does it perhaps seem that there is a want of connexion between the reign of law so graphically indicated in the first part of this quotation and the religious attitude of its close? If so, I think it is because you have read nature too superficially. If the first lesson of nature is the inflexibility of law, the second lesson of nature, if not for the man of science at any rate to the philosopher, is that which has been stated in a thousand ways, but by none more tersely than by Schelling when he says: "Nature is visible spirit; spirit is invisible nature." The American divine, Theodore Parker, gives utterance to the same thought, in language touched with religious emotion, when he says: "The Universe, broad and deep and high, is a handful of dust which God enchants. He is the mysterious magic which possesses the world." And Dr. James Martineau has a realising sense of this second lesson in the teaching of nature when he exclaims: "Beneath the dome of this universe, we cannot stand where the musings of the eternal mind do not murmur round us and the visions of his loving thought appear." Half truths are proverbially dangerous. If we trace forward into the domain of mind that universality of law which was first taught us through the study of nature, we must also trace backward into the material universe that informing spirit, the same in essence but different in manifestation, which is the very soul of our mental life. This, as it seems to me, is the teaching of the book of nature.

And so I pass to art. Here lack of time forces me to dwell not on the outer form but on the inner spirit. "Great art," says Ruskin,

"is the expression of the mind of a great man, and mean art, that of the want of mind of a weak man." And again speaking of one of Turner's paintings he says: "The picture contains for us just that which its maker had in him to give; and can convey it to us, just so far as we are of the temper in which it must be received." It is the human mind-element at the back of the art product to which we must pierce in our reading of the book of art. Browning knew and taught us this:

> "For, don't you mark? we're made so that we love.
> First when we see them painted, things we have passed
> Perhaps a hundred times, nor cared to see;
> And so they are better, painted—better to us
> Which is the same thing. Art was given for that;
> God uses us to help each other so,
> Lending our minds out."

Art reveals; and its revelation is twofold. It reveals nature, and it reveals the artist as an interpreter of nature. In reading the book of art, then, you are getting closer to the spirit of nature, and you are communing with a human soul. Miss no opportunity of such goodly and ennobling communion. Make the artist reveal himself to you in the symphony, the poem, the painting, the chiselled marble, the cathedral aisle. Goethe gives us good advice in his "Wilhelm Meister." "One ought," he says, "every day at least to hear a little song, read a good poem, see a fine picture, and, if it were possible,"—how much there lies in those four words!—"if it were possible, to speak a few reasonable words." Note well—"a *few* reasonable words" is the utmost that can be expected. What a reproach to some of us who are bubbling over all day long with much noise and much froth! Was it not Pope who said: "It is with narrow-souled people as with narrow-necked bottles; the less they have in them the more noise they make in pouring it out"?

Do not be ashamed of hearty admiration as you read the book of art. There is a silly modern habit, bred of supercilious inanity; a habit of feigned indifference in the presence of great art. Carlyle was truer to human nature at its best when he said: "It is the very joy of man's heart to admire where he can; nothing so lifts him

from all his mean imprisonments, were it but for moments, as true admiration." The more you read of this book the more will your life-work be ennobled. "For the narrow mind," says Goethe, "whatever he attempts is still a trade; for the higher an art; and the highest, in doing one thing, does all; or, to speak less paradoxically, in the one thing which he does rightly, he sees the likeness of all that is done rightly."

And so we pass to the book of life. It is a book we must all read for better, for worse. Through it we get our final and most searching schooling. Speaking, I think, of Stirling, Carlyle says: "To him and to all of us, the expressly appointed schoolmasters and schoolings we get are as nothing, compared with the unappointed incidental and continual ones, whose school hours are all the days and nights of our existence, and whose lessons, noticed or unnoticed, stream in upon us with every breath we draw." "We accompany the youth," says Emerson, "with sympathy, and manifold old sayings of the wise, to the gate of the arena, but 'tis certain that not by strength of ours, or of the old sayings, but only by strength of his own, unknown to us or to any, he must stand or fall." How much then depends on what faculties in the youth we have trained and educated! Bad for us indeed, if Ruskin's sweeping indictment of us all is true. "The main thing," he says, "which we ought to teach our youth is to *see* something—all that the eyes which God has given him are capable of seeing. The sum of what we *do* teach them is to *say* something."

The book of life is one that deals with action and strenuous endeavor; and its teaching is that we too should be active. Be up and doing what is good and useful, is its continual burden. "To get good," says Dr. Martineau, "is animal; to do good is human; to be good is divine." "A man's true wealth," we read in one of the sacred books of the East, "is the good he does in this world. When he dies mortals will ask what property has he left behind him; but angels will inquire, 'What good deeds hast thou sent before thee?' Terrible is the picture drawn in another Oriental parable. "In a region of black cold wandered a soul which had departed from the earth; and there stood before him a hideous woman,

profligate and deformed. 'Who art thou?' he cried. To him she answered: 'I am thine own actions.'" These are the words of allegory. But do we not all constantly stumble on our own deeds, stalking abroad in this work-a-day world, and meeting us with reproaches or with smiles?

I am speaking to many whose life-work is, or is to be, educational. Read the three great books; drink deep of their manifold lessons. Remember what Goethe says: "There is nothing more frightful than a teacher who knows only what his scholars are intended to know." In these latter days we might say that such a one is not a teacher but a text-booker. I think it behooves us, of all people, to realise the continuity of mankind—that which Pascal expressed when he said: "The entire succession of men, through the whole course of ages, must be regarded as one man, always living and incessantly learning." We, therefore, who are teachers, are educating not only boys and girls, not only young men and young women, but the mankind that is growing from age to age. As we ply the educational loom we are weaving the fabric of futurity. Every mistake we make, whether through ignorance or through carelessness, will leave a blemish in the final product. But on the other hand, as Ruskin says: "Every noble life leaves the fibre of it interwoven forever in the work of the world." To express the same thought through another metaphor, we are all partners in the firm which, when it originated long ago in the days of the monkeys, was styled, "Self, Sons, & Co.," but which, in our own days, has been incorporated as "The Society of Man—*un*limited." "It is," as Burke says, "a partnership in all science; a partnership in all art; a partnership in every virtue and in all perfection. It is a partnership not only between those who are living, but between those who are living, those who are dead, and those who are to be born." If our reading of the book of life do not impress upon us, first, the fact that we are all of us partners in the society of man, and, secondly, that each of us, as a partner, is in honor bound to loyally serve the firm in his own particular corner of its operations;—if it have not taught us this, we have been careless readers and have failed to grasp its lessons. "It has been said," says Goethe, "and over

again said, 'Where I am well is my country!' But this consolatory saw were better worded: Where I am useful is my country! And now if I say," he continues, "Let each endeavor everywhere to be of use to himself and others, this is not a precept, or a counsel, but the utterance of life itself."

Lastly, remember that there are two stages in our life's education; first, an imitative stage, and, secondly, a stage of originality. The first is an essential preliminary to the second. "It is only the imitative mind," said Winwood Reade, "which can attain originality; the artist must learn to copy before he can create." But do not be content to remain in the first stage. As Emerson tells us: "There is a time in every man's education when he arrives at the conviction that imitation is suicide; that he must take himself for better, for worse, as his portion; that though the wide universe is good, no kernel of nourishing corn can come to him but through his toil bestowed on that plot of ground which is given him to till. The power which resides in him is new in nature, and none but he knows what that is which he can do, nor does he know until he has tried." Conceive an ideal of what you would be and bend to its attainment all the forces of your nature. Endeavor to become in vital fact the ideal of your conception. You are bound to fail; but only through failure can you deserve success. Therefore, do not be disheartened if, after all, the results of your efforts seem insignificant. Remember what Mrs. Browning says:

> "Let us be content, in work
> To do the thing we can, and not presume
> To fret because it's little."

And now two more quotations, and I shall have fulfilled my task. The first is from the author of the Euphues. "Frame, therefore," says John Lyly, "your lives to such integrity, your studies to the attaining of such perfection, that neither the might of the strong, neither the mallice of the weak, neither the swift reports of the ignorant, be able to spotte you with dishonestie, or note you of ungodliness. The greatest harm that you can do unto the envious is to do well; the greatest corasive that you can give unto the ignorant is to prosper in knowledge; the greatest comfort you can be-

stow on your parents is to live well and learn well; the greatest commodity that you can yield unto your country is with wisdom to bestow that talent that by grace was given unto you."

And my last quotation is that quatrain of Sir William Jones's, translated from an Arabian source, which will doubtless be familiar to some of you:

> "On parent knees a naked new-born child
> Weeping thou sat'st, while all around thee smiled.
> So live that, sinking in thy long last sleep
> Thou calm may'st smile, while all around thee weep."

C. Lloyd Morgan.

University College, Bristol, England.

THE WELL-SPRINGS OF REALITY.

THE term "reality" here includes all phases of actual experience, "inner" or mental, "outer" or perceptual; in short, all modes whatever of what we call knowledge or consciousness. An inquiry into the well-springs of reality is, therefore, an inquiry into the grounds of the genesis and content of consciousness, and is, as all such attempts must be, metaphysical. It is, indeed, impracticable for any hater of metaphysics to moot such an inquiry without stultifying himself, for the solution of the riddle is itself metaphysics. Not without amusement do I note the number of agnostics, positivists, materialists, and others who have failed to realise this fact, and no doubt most of my readers must have been similarly regaled. It must suffice now merely to emphasise its importance.

In Part II of my *Riddle of the Universe* I have endeavored to show that any solution of this *crux* must be *idealistic*, that is to say, must find the ultimate ground of reality to be essentially the same as consciousness. I say "essentially" the same because, as I have shown at length, the ground, though illuminated in and as consciousness, is not as *prius* itself conscious, but *meta* or *super*conscious, potentiality, not actuality. I have farther shown—and as yet I have found no critic resolute or honest enough to face my arguments—that this ground is no mere Hegelian idea, wherein numerical difference is lost, but rather a unity-plurality, demanding the formulation of a monistic monadology as the basic truth of philosophy. In no sense can this idealistic ground be regarded as *reason*, as so many modern echoers of Hegel declare. And in no sense, again, can reason be said to mediate the production of our own sensuous experience.

These are all positions of leading importance, and I propose here to offer some observations which bear upon them. But of necessity my allusions must be fragmentary. Those who desire a fuller survey of them will find this in my already published work and the forthcoming volume of essays which I am now preparing for the press.

What, then, in the first place, is our warrant for accepting idealism at all? Assuredly this—that we must found our thinking on experience, and experience is no other than states of consciousness. Mind and world, mental facts, and object facts *differ*, it is true, in notable regards (and the differences have been frequently catalogued by thinkers), but they agree in the all-important point, which overrides all else, of being states or determinations of a subject. The *idea* I have of a tree is no more and no less a phase of my subject than is the original *perception* of which it is an echo. I see no possible way of escape from this position. Of course, we must not, like the so-called psychological idealists, make the world an appearance only within "mind"; "mind" is a general name for a fluctuating *series* of states historically later than the first sensations, and so no possible container or producer of these. In contrast to this view it will be necessary to maintain that "mind" and "world" subsist only in relation within the individual ego or monad, the spiritual ground of those two contrasted aspects. But here an objection may be entered. "By what right," it may be asked, "do you speak of an *individual* monad?" Echoers of Hegel and his like will be, of course, up in arms. In answer to these objectors I will point out that on their own showing philosophy should be only the rethinking and rereading of the "given" or experience, and that this experience *itself decides the problem.* Nothing is more certain than that this experience exhibits our "selves" as radically self-contained or impervious; *A*'s consciousness never penetrating that of *B*, or *vice versa.* In "I am I"—a *feeling* not a thought, and a feeling realised far more vividly in the presence of things than thoughts[1]

[1] "Things," not being thoughts, but determinations of the *contrasted* object-consciousness.

—we have the individuality of the individual proclaimed outright. That which distinguishes between "mind" and "world," and yet at the same time reveals itself *in them and through them*, is no vague "subject of consciousness in general" as some latter-day idealists still fondly believe, but a monad, that is to say, a unitary centre of consciousness, actual *or potential.*[1] So clearly does experience warrant this standpoint that one may well be at a loss to discover why the vague subject "in general" was ever posited at all. Without doubt, so far as Western philosophy is concerned, we have to thank the Post-Kantians for this dubious boon; the rush for *conceptual abstractions* having for long been dominant. Hegel, indeed, in elevating the concept into the *prius* and striving in grotesque fashion to exhibit it as the very substance and driving power of the universe, brought idealism finally into the gravest disrepute. In assailing his arid panlogism, Schopenhauer did most useful work, but he, too, was too impressed with the "in general" bias to pluralise adequately the WILL which was to oust the concept. He paved the way, however, unwittingly for a rehabilitation of a monadology such as was outlined by Leibnitz, as from a different standpoint did Herbart. This rehabilitation I have endeavored to promote still further; the first fruits of it being already before the critics. Numerous as are the contentions that buttress this attempt, they pale, however, so far as concerns man, before the testimony to monadism furnished by our ordinary workaday consciousness. The individual monad or subject, in short, is a *datum*; the universal subject contended for by some *may* be a figment and can at best receive only indirect inferential support. All we know immediately is—ourselves.

Positing a subject as ground, source, and sustainer of our fugitive states of consciousness is no longer, I opine, avoidable. As I have argued at length elsewhere, "No subject, no flux of sensations; no subject, no order of sensations in space; no subject, no memory, no expectation; no subject, no introspection; no subject,

[1] The actually conscious segment being comparable to a star-point seen against the vast dark background of the sky.

no explicit I-reference." The necessity of positing a subject is, however, admitted by most modern idealists, though touching the questions of its unity, consciousness, and rationality as *prius* great disputes obtain. Many Neo-Hegelians posit only one "eternally complete" and *rational* consciousness as ground of experience in general—this implies a peculiar theism which lends itself usefully to thinkers anxious not to seem heterodox. Schopenhauer, again, denied the rationality of his *prius*, the blind and unconsciously world-spinning will. Other idealists, again, object to will as much as they do to reason when adduced as *prius*, and seek refuge in a consciousless spontaneous ground of which "will" and "reason" are at best mere phenomenal aspects. Probably the ultimate decision of philosophy will be in favor of a monistic monadology, embodying this latter view. I have already pointed out that a *merely* monistic ground is at variance with the experience on which all philosophy must found.

To return, however, to our view of idealism, the view that reality, as well mental as physical, is appearance in a monad, we find ourselves face to face with an obviously subjective idealism. And dwelling especially on the *crux* of physical reality, we seem forced to include everything within our monads. To a certain extent this course would be justified. But when once we have decided that perceptions are states of ourselves, there arises the further question as to how these perceptions are produced, how experience of the "outer" sort is possible. Why in short seeing that these perceptions are only states of our monads, do we have them after the actual fashion and manner in which they arise? The monad in *becoming conscious* clearly unfurls itself, but why in the way of which we are momentarily aware? In the answer to this problem we may, as I have shown, find a clue to the secrets of the universe.

The answer lies in a monadology and is too elaborate to condense within the limits of a brief paper. It includes, of course, the explanation of the working of those bodily, or rather cerebral monads, in relation to which our monads pass into consciousness. Ignoring this explanation, it is at present of chief moment to make it clear in what way the positing of these subordinate monads can be

justified. I answer in the following way, limitations of treatment being, of course, here inevitable.

Subjective idealism must of necessity find prominent recognition in philosophy—primarily and immediately "the world is *my* presentment." But I believe that beyond the pale of my monad or subject, other human subjects are perceiving, willing, and thinking, and this belief, the product of association, is involuntarily thrust upon me, enforcing my practical allegiance to it. It is only in the study that a Fichte or Hume questions the actuality of "selves" other than himself, in the market-place inseparable associations leave him no option. My readers, however, not questioning the accuracy of the belief, it remains to ask them to exploit it. By dint of the following argument we may achieve an important result, enabling subjective idealism to receive an objective idealist supplement reconciling it adequately with the fullest demands of vulgar common sense. I cite a passage from my *Riddle of the Universe*, for which I cannot at present offer a better substitute:

"As an aspect of its content, the subject holds before itself the world, the whole play of perceived objective relations. But scattered through this consciousness are various objects (human and animal organisms) which invite extra-experiential reference to corresponding ejects. Now the validity of this reference is not denied by the wildest sceptic. Inasmuch, however, as this reference is based on observed changes in the objects, it follows that *specific* changes within *my subject are symptomatic of changes beyond its sphere*. Thus the shifting contorted features of an angry man are nothing more for my subject than so many colors, lights, and shades, having varying positions in space, and recalling the usual bundles of interpretative mental states. They are simply phenomena of its consciousness. But they are phenomena with an extra-experiential reference to an angry consciousness of which *I have no direct experience*, but which is as real as my consciousness that seeks to symbolise it. The conclusion is, therefore, inevitable that, as certain changes in my subject cohere with other changes beyond its sphere, the transcendent validity of causality must be held established. This result cannot be ignored by idealism.

"And now let us look further. The indices of the changes taking place in other subjects are, as above stated, changes in our perceptual consciousness of objects. But suppose a case where, from pathological or other reasons, the movements of a face have no longer a true reference to a consciousness beyond our experience. Suppose, in short, that the man goes to sleep. What then? Does the *mere* temporary eclipse of that alien consciousness rid our perceptions of their prior extra-

experiential reference? Are we to suppose that for this trivial reason the play of our shifting percepts no longer answers to an activity beyond experience? This is just what we cannot do. Having already *a posteriori* proof of the transcendent validity of causality, we shall endow it with a yet further significance. We shall contend that the changes in our perceptions are somehow allied with extra-experiential changes to which the eclipse of the alien consciousness makes only an inconsiderable difference. At last an activity other than that of a human subject is in evidence. We must recognise that *the changes correspond to activities not in the consciousness of another human subject, but to activities with which that consciousness is normally only associated.* Thus indeed are we able to establish the activities of what are ordinarily spoken of as the noumena of objects; for the same reasoning which holds good of the organism correlated with the eclipsed consciousness *holds good* of all objects alike."

At first sight it might appear that we are only able to make good Kantian "things-in-themselves" as the occult causes or part-causes of our perceptions. And in a sense it is true that things-in-themselves admit of a vindication if we follow up this clue. Unquestionably the activities treated of obtain *independently of our consciousness*, are, indeed, part-causes of the mode in which that consciousness actually unfolds. But, on the other hand, these things-in-themselves are no *surds* or unknowable x's, but essentially the same as what we know as consciousness—activities in short of a spiritual but a-conscious sort. An assertion of this kind may seem out of keeping with a philosophy which founds and builds wholly on experience. But really the reverse is the truth, for if experience is a system of variously related states of consciousness and never, *ex hypothesi* anything else, any activity which we can moot must be expressed in terms of consciousness. And in fact the wretched *abstractions* "matter," "force," "energy," "unknown substance," etc., etc., on which materialists and the rest base their creeds, are themselves only names connoting aspects of the ordered *states of consciousness* we call "world." They are names only for *phases of our object-consciousness* divorced from the variety of other phases in connexion with which they are known. The fact is, that so far from being able to posit any activity *alien* in essence to consciousness we cannot possibly even moot this activity except in words. It is *not even present* to our intellect or imagination as a subject which can be

discussed—it is wholly and absolutely a *verbal myth.* We have arrived, then, at this position.

1. There are activities which are to be posited as obtaining independent of my consciousness or any human consciousness.

2. These activities are spiritual, i. e., essentially the same as consciousness, though probably *without self-feeling*; consciousness, as I have shown elsewhere, being a mere *star-point* visible over against the indefinitely vast background of the Metaconscious.

So far, so good. But now it is necessary to make our knowledge of these extra-experiential activities *more precise.* Are they *aspects* only of some unitary spiritual whole such as the "idea" of Hegel or the "unconscious" of Von Hartmann; or are they energies of monads—of plural centres of consciousness (actual *or potential*—the question of the relation of these monads to a universal subject remaining over for later treatment? Following up the clue given by causality, an *empirically acquired* but provably effective ally, we may proceed to establish a monadology.

Obviously from our knowledge of the human monad—the individuality of which is self-revelatory—the presupposition is in favor of the positing of monads in other domains than the human, and coming to interpret the results of science we find that monads, and monads alone, can serve as an even plausible interpretation of these results. This is especially noticeable in the case of chemistry, the atomic doctrine at present a mere *scaffolding of symbols* being adequately transformed and brilliantly illumined by monadology. That this theory, formulated to cope with most varied and most remarkably convergent streams of evidence, is *merely* a stage in Reason's interpretation of itself, as Hegelian abstractionists have to hold, is one of those absurdities that have made metaphysic a laughing-stock. It is much more than this, a very abstract presentment of the relations of monads, viewed, as the *interests* of men of science require, in a dominantly *mechanical regard.* The irony of destiny appears here when we contemplate atomist theory. The terms in which atomic relations are discussed are all drawn from observation of activities within our own consciousness, and, indeed, could have no other origin, and necessarily, therefore, in many cases have a

notoriously subjective import ("affinity," "attraction," "preference," "repulsion," etc., etc.). We may, in fact, affirm that the monadologist only clears up with full reflective consciousness what many a hostile man of science grasps confusedly. An entire rethinking of chemistry and physics on monadological lines will doubtless be one of the leading feats of the next century. A work of such a character would be of momentous interest and one valid page of it would outweigh all the arid scholasticism of Hegel's "logic" and that of the modern guild-philosophers who have smothered idealism in words in the hope of exalting "reason."

Monadology is obviously an enormous subject, and I do not, of course, pretend here to do more than indicate aspects of this fact. Much has been already done by Leibnitz, Herbart, and others, and I, too, have done my humble best to strengthen and extend monadist doctrine. But by far the greater part of the work remains over for others to complete. With a vital meaning for the *cruces* of external perception (normal and supernormal), of freedom, of the neurosis-psychosis relation, of sensation-genesis, of ethics, theism, pessimism, the world-purpose, import of the individual, etc., etc., and, indeed, of all metaphysical questions whatever, monadology may well task the most earnest efforts of the inquirer. Monads, human, subhuman, superhuman, are the WELL-SPRINGS OF REALITY, and no idealism ignoring them can prove adequate. Unlike Hegelianism, which never gets near a fact, and deludes the book-worm with word-spinning and hollow dialectic, monadology admits of exploration by induction on the lines of the complete method.[1] Once established in decently adequate fashion it must appeal to every storm-tost wayfarer as the phrases of academic scholasticism never did and never will. The "riddle of this painful world" as treated by the guild-philosophers breeds pessimism and disgust with metaphysic. Interpreted by a severely critical monadology, it will be found to lose its forbidding aspect. I am, of course, only in favor

[1] Doubters may be referred, in passing, to the pregnant declaration of Mill, *Exam. of Sir W. Hamilton's Philosophy*, p. 259, 5th edition, for the timely observation that induction is not necessarily confined to the sphere of the individual consciousness.

of admitting results where the latter are enforced by careful inquiry (though some of my less honest or more lazy critics have thought fit to say otherwise). The consolatory aspect of a doctrine should be obviously only an afterthought.

Before closing this paper I should like to say a few words touching the current Hegelian treatment of external perception, a treatment which a monadist rethinking of things seems to render wholly superfluous. As is so well known, Kant, anxious to import universality and necessity into the external experience, loosened by Hume, thought fit to assume various categories or "pure concepts," subsumed under which phenomena unified in space and time become *objective*. In the Kantian handling of this hypothesis, the categories are discussed as if superimposed by the ego on the phenomena (the "matter" of which is "given" and unified in space and time), and *importing into* them universality and necessity. With Hegel the categories are *immanent in* the phenomena, reason or the concept being implicit in nature previous to becoming explicit in our adult consciousness. It is urged that experience is not possible except on the lines thus indicated. A more absurd contention could scarcely be advanced.

On what ground is the category-doctrine defended? On this—no such categories, no experience such as we have. How are the categories got at, as they are never given unalloyed to the inquirer? By abstractly analytic reduction of experience to its "elements," obviously the only resource. But it is as well in this process to see that the "elements" arrived at were *really conjoined primarily* and are not mere figments of the philosopher. Take the so-called category of being. Now I would urge that no such category is immanent in objects at all—"being" is a general conception only empirically derived from observation of things. "Ah," says the Hegelian, "you forget that you cannot abstract from things what is not there to be abstracted!" This is a good objection, as it enables one to state the opposed view more clearly. The truth is that "being" is not a thought or concept *save for reflexion*; the being of things is *a feeling, a sensation*, and no thought or concept at all. And how does it arise? From the *concrete opposition* of its content to itself by which

the monad mediates its consciousness, an activity wholly alien to the *contemplative passive and abstract* character of reason. I am glad in this connexion to note that that able critic of Hegel, E. Belfort Bax, has in his *Problem of Reality* declared that being in the percept is not logical but alogical. Good this, but why does not Mr. Bax go further? Clearly, however, the Hegelian dialectic must suffer if being is thus treated as alogical. The starting point declared faulty, what of the succeeding journey? Mr. Bax's dictum should cause the Hegelians to rage.[1]

Mr. Bax would retain nevertheless such categories as "causality," "substance," etc., as instruments wherewith his Subject of experience in general constructs our perceptions. This subject thinks the categories into the presentment, and *we* get the result as a ready-made world of objects. I have previously stated my objections to this "universal subject" theory and need not repeat them here. Even on monadist lines, however, it might be urged by Bax that categories latent in our subjects help to construct objects. But the hypothesis is superfluous. The *native* objectivity of sensation is admitted in his treatment of being, and, this important admission once made, the call for the other categories loses its force. For the rest we may rely on "association" as so richly expounded by British psychologists, such "association" (whether harking back to ancestral experiences or not) being viewed as reflexion in our central monads of the workings of the monads of our brains. As I have urged elsewhere:

> "Not categories, but cerebral monads mediate the *fuller* objectivation of sensation into the ripe world we know; their activities being passively duplicated in the subject [central monad] as the infant consciousness dawns. *Nerves and brain wirepull the adjustments of organisms to surroundings and the reflex of this adjustive mechanism in the subject* IS *the very process of the fuller objectivation itself.*"—*Riddle of the Universe*, p. 337.

While dwelling on this point, I will add that a grave mistake

---

[1] Stirling well observes, and the concession from him is striking, that Hegel's logic, "though containing much that is of *material* importance, is still principally *formal* . . . if the start be but an artifice and a convenience, is it all ascertained yet that the means of progress, the dialectic, is in any respect better?"

of the past, and, to a lesser extent, of the present, was and is the view that "relations" are necessarily generically other than the supposed terms they relate. It would be better to recognise "relations" as really only a kind of sensations as *particular* as the other sensations along with which we have them. "Being" in the object is a sensation, so, too, is "causality," which consists mainly, if not wholly, of ideal sensations of effort felt along with some time-sequence, and felt, too, with varying force *according to the nature of the time-sequence*; a most notable fact. A metaphysic of real utility should concern itself not with phantoms of the book-worm, such as categories, but with the origin of the many-hued concrete sensory experience whence these categories and indeed all concepts are ultimately derived. Conception is the process of "taking together" *agreeing aspects* of the given: a concept is the result, a name connoting this agreement. To say that we abstract concepts from things is not to say that the concepts are implicit *as such* in them, like plums ripe for picking. There is no concept "tree" in the perceived world, but only indefinitely numerous concrete trees which resemble each other in certain ways bearing on our interests and are classed accordingly. Similarly there are no concepts being and substance "realising themselves in multiplicity," as the phrase goes, in this world. There are certain phases of reality, certain powers of sensation in part primitive, in part acquired, which mingled inextricably with other sensations make up the concrete whole of sense. True every phase of this whole is related to every other, but this is because they are modes only of that *presentation-continuum* in which the *unitary subject* unfolds itself. Unrelated phases there are none, but the relations are in no sense "thoughts." Out of this continuum arise both "universals" and "particulars," and to inquire into its genesis should be the most studied aim of the metaphysician or mystic. Not fussing about empty "notions," but researches as to the genesis of the experience yielding the notion is the really important affair. From having certain sequences in our monads we probably get the notion of causality, but this notion, be it observed, in no way helps us to understand *why these sequences occur as they actually do*, why, for instance, a stone when released

falls to the ground. Here the notion-juggling Hegelians fail us, as they always do when any problem of real interest crops up. The only clue is that of monadology, exploited on the lines of the "complete" method and in full accord with psychology and physical science generally. At this point, however, conscious of having unduly extended my remarks, I must bid the reader adieu, trusting that he may find ultimately idealist monadology to be as competent to answer the world-riddle as I have. Stray hints are occasionally of value, and despite the exigencies of space it may be that one or two in this paper may find a permanent lodgment in minds open to conviction.

E. Douglas Fawcett.

Devon, England.

MUSIC'S MOTHER-TONE AND TONAL ONOMATOPY.

PRELUDE.

OBSERVE how the whole orchestral throng clusters about her; caresses her: how the mischievous little bows catch up her apron-string and prance out with it, then come back and loll at her knee, and look up into her eyes, and whisper her name; how the clarinets seize and sound that name deeply, then scurry with it along the tone-fence, pretending that they are going to jump off, as do those orchestral big boys—the *contra-bassi*; how the *'celli*-bows first give it an inflection of filial love, then utter a sigh of romantic susceptibility, as they saunter towards the tone-bridge, over which they seem ready to vault at beauty's command; how the lowing horns echo that name; how magically it makes the fiery trumpets, the phlegmatic trombones, and even those orchestral athletes—the prosaic bass-drums—as well as the chattering group of aspiring flutes and pert piccolos and cry-baby *hautboys* and quacking fagottos properly decorous in the midst of their wildest fun, the surge and swirl of which only the master's baton can hush, with its apparently unwelcome signal for taking up their respective burdens of labor and care.

This hush often makes me wish—as did that Eastern potentate, who found this topsy-turvy, seething mass of sounds so indescribably charming—to *encore* it.

* * *

Music's mother-tone is man's mother-tone; the original vowel sound, the primitive A (Ah)—the first, simplest, easiest of all vocal

utterances: the onomatopic vocable for mother. Man, to intensify its love-symbolism in verbal expression, gave it the verbo-consonantal prefix, M—Ma: and children verbally melodised and sweetened this symbolism by iteration—Mama.

Good examples of the use of Ma may be found in the simple, verbo-tonal, slumbersome lullabies of the primitive Esquimaux.

Man idealised the mother-tone in tonal speech by adding thereto tonal consonants, chosen because of their being onomatopic of his numerous mother-needs; and, as the demands of his varied emotions for æsthetic media of musical utterance grew, he sought for other tone-vowels, consonants, tone-combinations, tone-sequences, until these tone-language materials joined, blended with each other, took shape, coherence, symmetry, and music became his vernacular tongue.

Naturally onomatopy has had much to do with this musical evolution; as, with its simple cries, men everywhere naturally express their feelings; which cries, as the crying one's desire to be heeded by the listener increases in intensity; or, as one phase of his emotion merges into another, are reduplicated, inflected, or joined to other sounds within his vocal command, in alliterative concord or otherwise, for the purpose of deepening the impression of the affection to which he is then giving vocal utterance, upon the listener; and that in tones, phrases, strains, tone-movements, of whatsoever kind they may be, this onomatopic element must be present, if we would have the tone-language closely, correctly, intimately, satisfactorily subserve its purpose as such.

The mere mechanical reiteration of the name of the Vaishnavic god, Hari, in which the A-tone is chief, secures admission to the Vishnu's heaven.

In the early Hebrew tonal accents and indeterminate notation we find numerous onomatopic suggestions which are clearly in line with and illustrative of the originally tentative condition of the tone-language; this notation of a flexible tonality allowing of as widely different tonal interpretations, changes, as does, verbally, the Aryan tongue, from which sprang the Sanskrit, Greek, Latin, German; and our own copious English has more sounds than symbols. The

wonderfully intellectual Egyptians, by their use of an indeterminate notation, confessed their need for a notation other than that whose signs are of fixed notes, as well as for tonal onomatopy; and Moses doubtless obtained suggestions, through his musical culture in the Pharaonic court, which caused the Hebrews to meet the onomatopic exigencies in their song-services by their indeterminate notation, with its oral amendments, qualifications, accents, thereby rendering their music so variable, that—chameleon-like—it took the tone-color of whatever land they sojourned in,—a habit initiated by their Egyptian captivity.

Man etherealised the verbal with the tonal, artistically, and extended, when so doing, onomatopy from the spoken to the sung; causing it, naturally, to dominate the constructive art-growth and scientific evolution of music, its essence being the unobstructed semblance of sound to sense; a semblance vastly superior to that of words, because unembarrassed by verbal dross.

Read this fine verbo-onomatopic excerpt from Southey:—

"How does the water
Come down at Lodore?
Rising and leaping,
Sinking and creeping,
Dividing and gliding and sliding,
And falling and brawling and sprawling,
And bubbling and troubling and doubling,
And rushing and flushing and brushing and gushing,
And flapping and rapping and clapping and slapping,
And thumping and plumping and bumping and jumping,
And dashing and flashing and splashing and clashing,
All at once and all o'er, with a mighty uproar—
And this way the water comes down at Lodore."

Then turn to Beethoven's Pastoral Symphony: scan its scenery, hear its deep, fine-thoughted voices, all marvellously true; truer than Southey's words, or even Rembrandt's visualistic colors.

The presence and power of onomatopy in music, wherein it exceeds in importance music's other rudiments, are as self-evident as are its presence and power, as a formative principle in other lan-

guages. To it pre-eminently indeed may be accredited music's tenacious hold on man and its profound effectiveness; and to that degree in which music is onomatopic does it serve its lingual design, and as a medium for the utterance of sentiment. It is that principle from which that tone-form which individualises, nationalises music springs, flowers, and to which we must look for a key to the primitive, radical, individual and national characteristics of music.

The inspiration of its formative power in the construction of musical expressions is easily established by analysis thereof; particularly of those which are primitive and precede all acoustic science, and are unburthened or refined by the adornments of musical art, or the culture of those musicians who use them: they not being the composite heritage of many and diverse languages—a Babel—but the utterances of the original, primitive, virgin voice of man, as unchanged by the lapse of time as are man's five senses; these utterances evidencing the ever-present operation of their primitive impulses and of man's common imitative faculties.

They show themselves to be the tone-germs from which are evolved the endless varieties of musical composition; germs found not only in the voice of man but in the voices of the animal kingdom at large.

The mother-tone A, with the Ma, Ba, of every baby; white or black; bond or free; born of ignorant or learned parents; of the baby of all nations under the sun: this cry of lamb, kid, calf, with its feline and canine modifications, is one of those germs; one which expresses a crying desire, the immediate satisfying of which is sought.

This cry takes its start from the mother-tone A, whose musical notation is placed on the second space of the treble staff. This mother-desire being common among children, this mother-tone, with its consonants, their inflections and dynamic changes, becomes onomatopic; first of babyhood, then of mother-love, mother-longing, home-love, home-longing, love to others and of its cognate affections.

Observe how the composer of the melody of "The Last Rose of

Summer," or, of that of "Home, Sweet Home," does loving obeisance to the mother-tone.

Let the reader try to sing or play either of these songs, with some other tone substituted for A, if he would realise practically its vital importance in their melodic structure; and how the foster-spirit of the mother-tone extends naturally in melodic construction, by tonal transposition,—as in the melody of "Annie Laurie"; and how it pervades all tonal matter by the operation of a basic law of tonal mammalogy. Search the musical scriptures; study the phrasings of passion in operas, for evidences of the debt dramatic music owes to onomatopy; illustrations of which cannot well be produced here, excepting by the use of music-staff, clef, notation; but which, whoever is interested therein may entertain himself rarely by finding in the works of Wagner, Verdi, and other emotional geniuses. From the works of these modern composers let him go back, step by step, to the primitive, simply formed music of all peoples, and mark how—through onomatopy and its tonal affinities—this music is unified; and how, in the mother-tone and its onomatopy, however deeply imbedded, lies the secret of music's universal heart-sway. This tonal protoplast and its multitudinous progeny—their art, first empirical, then scientific—are so cadenced in the works of such composers as Beethoven and Wagner as to produce in the listener's mind pictures of their ideals etherealised to that degree which no art but music can reach.

The word-creations of Homer, Shakespeare, and Dante abound in verbal onomatopy. Yet their noble sonorities cannot be said to attain that influence over the reader or listener which the tonal masterpieces of Beethoven, Wagner, or Berlioz, effect.

As Mr. Gladstone assigns those poets chief honors for verbal onomatopy, I would cite these three composers as their worthy onomatopic brothers; the compositions of no others appearing to me to show a profounder knowledge of phonology, nor the carrying of tonal onomatopy further towards the state of an exact science. The more these tone-masters' works are studied, in an onomatopic regard, the more do these masters seem to tacitly confess their being hindered, in the use of tonal onomatopy by the imperfections in,

and limitations of, the present system of musical notation; and to sigh for one like unto that of the Egyptians or Hebrews, in indeterminateness.

Fortunately for the modern music-lover they had none; for where is the musical genius who could rightly interpret their unexpressed accents?

As the composer's thoughts are too idealistic to content themselves with the expressional resources of any verbal tongue, though never so perfect; they, being wholly divested from the earthy in conception, necessarily chafe under the restraints of this notation, in their endeavors to lead the music-lover from the phenomenal to the real.

The composer is an Orpheus, who proposes to satisfy himself with no accomplishment short of compelling earth's stocks and stones to live, move, and have their being at the sovereign command of his genius. Why did Wagner set his words to music, if not failing to find in words those æsthetic media in which music is so opulent? And why does he exclaim—in the midst of even his tone-wealth, with Saint Paul—"except these bonds?" Wagner reached from words to tones, as did Rossetti from words to tints, and to a perfect freedom of tonal expression; no composer evidencing in his works more than he a desire for a fixed notation which recognises closer, nicer sound differences than does the present one; —an enharmonic notation—with all the instruments of the orchestra constructed to produce them; one rendering the influences of onomatopy on music freer and more powerful.

The tone-shading, onomatopic resources of the violin-class of instruments make of the orchestra, in this respect, a truer exponent of feeling than it would be otherwise; and onomatopy ever strives to free our tone-scales from their arbitrary parcelling of tones into integers, in order to broaden and render truer the expressional powers of music for their employment in the domain of definite emotional ideas.

I find that all music, in which onomatopy dominates its phrasing; in which the tone suits, or suggests, the voice which man instinctively gives to that sentiment which the music seeks to express,

is the truest, most effective; because it individualises the music and leads it to obey—in its construction—the common law of humanity, as betokened by the onomatopic mother-tone as well as by man's activity in all the fine and inventive arts. Such music as this manifestly cannot be made a vehicle for diametrically opposed feelings; and clearly is, therefore, of a higher excellence than that which—like a cab—may carry anybody. Such music as this also evidences the importance and power of onomatopy as a musical rudiment, and its dominance over the mother-tone and other single sounds in the musical alphabet, sound-combinations and sequences produced by the evolution of music as a language, begun with the primitive mother-tone utterance, followed by all those tonal developments which man's changing feelings require, as fit tokens for those feelings, and of those passions which call them into vocal utterance; through whose operation, under the guidance of a law like that of Darwin, all tonality may have its genesis, growth, and present stature.

This tonal dominance of onomatopy doubtless is due to its having preceded and being above tonal art; to its being the direct, natural, and, therefore, truest symbolism of feeling; to its being the primeval basis of all tonality; the fundamental principle in which all tonal effects agree; and, to establish which, its advocate has but to divest the tone-language from the shaping, smoothening, sweetening, refining, to which the musical culture of centuries has subjected it, and reveal therein its supremacy; the dominance of the principle of imitation, of an imitation which reaches beyond analogy, beyond vague, shadowy suggestiveness; one which is the essence, soul of that which is expressed through its operation; one showing music to be not unreal, fanciful tone-painting, abounding in the wanton reds of a Rubens, or splotched yellows of a Turner, but a living speech; a mother-tongue, seized of, quickened by that soul of which it is the material, subordinate body, and which uses it merely as such.

In music's present condition, however, ample evidence may be found to establish the theory of onomatopy as a linguo-formative principle, if to do so be desired. Tonal onomatopy's status clearly

being self-demonstrable, I think we may safely assign such tonal effects as we cannot, under the present conclusions of musical science, trace to its influence—for example, Wagner's dream-sounds—to the realm of unconscious onomatopy; the onomatopy of musical ideas of which we are seized, without being conscious thereof; yet which take an independent coincidence and consonance with—and color—our conscious ideas when we compose music; as well as their influences on the listener's heart and mind when he takes a similar conscious, or unconscious, cognisance of the onomatopic element of a musical strain, and of its own definite, fixed, uniform æsthetic impression; its peculiar expressional significance and objective value.

As a device for ordinary tone-analysis it would seem convenient to divide all tone-elements into two classes: the onomatopic, or psychic, the tone-soul;—and the unonomatopic, the tone-body; and to let this division be used when examining the genetic processes of tonality, and the uses of the tone-language; it being qualified by the patent fact that each of these tonal parts necessarily partakes, to a certain degree, of the peculiar properties of the other; and by the innate truth that neither part can any more be separated from the other and live here as an independent entity than can man's soul and body.

On passing from tone-genesis to tone-art, onomatopy surely is a substantial helper in solving the relations of tone-forms, tone-phrases and expressions to each other, and in guiding the student to their causes; demonstrating, as it does, the tonal truism that their mutual resemblances are due to their common inheritance; their differences to their respective environments. It is, furthermore, a valuable aid for him who would leave speculative hypothesis and experimentally seek for an exact, demonstrable basis for explicative musical science and scientific musical art, through its abundant and valuable data. For, in a word, onomatopy demonstrates the synthesis of man's heart with man's mind. And he who seeks for scientific exactness in every onomatopic datum doubtless will bear in mind the fact that there is ambiguity even in words—Dante's words; and that if critics wrangle over the meaning of

certain musical movements, they have ample excuse for so doing in literary disputes ; and for mutual charity in their onomatopic investigations, especially when seeking to reconcile onomatopy with music-form theories ; chiefly with that of the coining of form into music *ab extra*, or with that which assumes a strict equivalence of music-form with pictorial form ; with the inevitable inference that it imitates an existing prototype,—a prototype easily traceable through the most abstract conceptions to an onomatopic germ expressive of an emotion ; the patent weakness in such an equivalence lying in the truth that music-form gets closer to its prototype than picturing it ; that it voices, becomes its prototype ; is very thought of its very thought.

A safe conclusion to reach in the premises, touching the form-element, would be this : Music-form is the imitative instinct ruled by the solvent, selective, constructive mind.

* * *

The acceptance of this conclusion makes easy the belief that music's origin is in feeling, and that, therefore, music is not an art in which form is a mere mechanism to produce emotion ; but that, contrariwise, it is an art in which form is produced by emotion, under the discipline of the solvent, selective, constructive mind.

Practical onomatopy, with its far-reaching forces, is, in modern musical composition, a double-edged, exceeding sharp tonal sword ; one to be wielded only by the steady, cunning hand of genius. A facile task is it for a composer to carry such a means for æsthetic expression to a degree of stilted, ludicrous mannerism ; to so burden, bungle, and technically pervert its symbolism as to unmusic music and reduce it to the sound-chaos of a brute-thronged barnyard, in which a dog, or cat, ordinarily quick to distinguish a human voice, might go mad in its endeavor to recognise a tone having any human mind back of it. Notwithstanding this quality of onomatopy its study shows that in its tones, tone-combinations, tone-sequences, dwell the æsthetic media of all emotions which are proper tone-art subjects. The use of these media comes intuitively to the tone-genius, because they are the heart, the inner truth, the life of his

mother-tone and tongue. He idealises, etherealises them, and the metaphysical, high art-results captivate, chasten, elevate us; fill our old world-worn, world-wise souls with the purity of infant-life and of that melody which men first syllabled with the mother-tone A.

C. Crozat Converse.

Highwood, N. J.

THE LATE PROFESSOR ROMANES'S THOUGHTS ON RELIGION.

ALL THE publications of the Open Court Publishing Company, purely theoretical though they may appear to be, are brought out with a very practical end in view, which is nothing less than the reconstruction of religion upon the broad basis of modern science. When we undertake to bring out scientific works, such as Ribot's psychological inquiries, Max Müller's expositions of the nature of language and of thought, Ernst Mach's history of mechanics and his popular lectures on the methods of scientific research, we do so because we trust that the spread of sound science is the best and most effective propaganda of true religion. We acquired from Prof. George John Romanes the right of publishing the American edition of his book, *Darwin and After Darwin*, because we recognise in the doctrine of evolution one of the most important and fundamental religious truths, upon the basis of which the old traditional dogmas will have to be revised and radically remodelled; and we have just now brought out the American edition of the same scientist's posthumous *Thoughts on Religion*. It is this latter book to which the present article is devoted, for it seems necessary to explain why we accept for publication a book which in many important points differs from our own solution of the religious problem.

In our opinion, science and religion are not two separate spheres which must be kept apart, lest the one should interfere with the other; but, on the contrary, both form integral parts of man's spiritual being and are closely interwoven as the web and woof of our souls. Science is the search for truth, including the

results of the search; it is the best recognition of the truth according to the most accurate and painstaking methods at our command; and religion is the endeavor to lead a life in agreement with the truth. What is religion but truth in its moral bearings upon practical life!

In opposition to this standpoint the *Thoughts on Religion* by Professor Romanes are antiscientific and agnostic, indeed, they stand in certain respects so much in contrast to the labor of his life, as to appear a disavowal of his former position.

While our religious convictions are quite definite and outspoken we do not propound them dogmatically. We simply submit them to the world for consideration; we solicit criticism from all quarters, because we trust that they can stand the severest strictures. However, supposing they could be proved to be erroneous, we shall not hesitate to publicly confess our errors; for it is not our aim to propagate our views because they are ours, but because we believe that they are true. If it be right that we must in religious questions sacrifice our intellect and cease thinking, let the truth prevail.

When the doctrine of evolution first dawned upon Romanes, it came to him, not as a religious idea, but as a revolutionary doctrine, which was slowly but radically destroying the very basis of his most sacred belief; and in order to understand the struggles which at that time distracted the mind of the young scientist, we ought to bear in mind that he was in his inmost nature not only deeply religious, but even uncommonly reverent and pious. Judging from his essay on Prayer, which he wrote when still a youth, in 1873, and by which he gained the Burney Prize at Cambridge, he was possessed of a childlike trust in the Lord, his Creator and Heavenly Father, whom he regarded as governing the world by general laws. Would a youth so settled in his convictions give up his faith when confronted with scientific conceptions irreconcilable with the errors of his traditional religion? How could he help it? Science is not of human make; science is the superhuman power of the silent voice of the Holy Spirit, who reveals himself to

mankind in an accumulative revelation, and no one can withdraw himself from its irresistible influence.

Romanes had thoroughly imbibed the rigid definitions of the traditional dogmatism. In order to substantiate the so-called orthodox conception of Christianity our ecclesiastical instructors have gotten into the habit of telling us again and again that there is no religion save such as is theistic, and that there is no theism, save such as is a belief in a personal God, and a personal God means a distinct individual being with an ego-consciousness like that found in man, only on an infinitely higher plane —a view which we call anthropotheism. Accepting explanations of religion, such as these, it was natural that Romanes, as soon as he became convinced of the errors of his narrow church-theism, should fall a prey to a desolate scepticism, and already in 1876, if not sooner,[1] he wrote a book entitled *A Candid Examination of Theism by Physicus*, which analyses the crude conception of the traditional God-idea, and finds it wanting.

We quote the following passage from the book, which is sufficient evidence of the author's sincerity:

"And now, in conclusion, I feel it is desirable to state that any antecedent bias with regard to Theism which I individually possess is unquestionably on the side of traditional beliefs. It is therefore with the utmost sorrow that I find myself compelled to accept the conclusions here worked out; and nothing would have induced me to publish them, save the strength of my conviction that it is the duty of every member of society to give his fellows the benefit of his labors for whatever they may be worth. Just as I am confident that truth must in the end be the most profitable for the race, so I am persuaded that every individual endeavor if unbiassed and sincere, ought without hesitation to be made the common property of all men, no matter in what direction the results of its promulgation may appear to tend. And so far as the ruination of individual happiness is concerned, no one can have a more lively perception than myself of the possibly disastrous tendency of my work. So far as I am individually concerned, the result of this analysis has been to show that, whether I regard the problem of Theism on the lower plane of strictly relative probability, or on the higher plane of purely formal considerations, it equally becomes my obvious duty to stifle all belief of the kind which I conceive to be the noblest, and to discipline my intellect with regard to this matter into an attitude of the purest scepticism. And forasmuch as I am far from being able to agree

[1] The book appeared in 1878 (at Trübner's), and we read in the preface that it was written *several* years before, but had been left unpublished.

with those who affirm that the twilight doctrine of the 'new faith' is a desirable substitute for the waning splendor of 'the old,' I am not ashamed to confess that with this virtual negation of God the universe to me has lost its soul of loveliness; and although from henceforth the precept to 'work while it is day' will doubtless but gain an intensified force from the terribly intensified meaning of the words that 'the night cometh when no man can work,' yet when at times I think, as think at times I must, of the appalling contrast between the hallowed glory of that creed which once was mine, and the lonely mystery of existence as now I find it,—at such times I shall ever feel it impossible to avoid the sharpest pang of which my nature is susceptible. For whether it be due to my intelligence not being sufficiently advanced to meet the requirements of the age, or whether it be due to the memory of those sacred associations which to me at least were the sweetest that life has given, I cannot but feel that for me, and for others who think as I do, there is a dreadful truth in those words of Hamilton,—Philosophy having become a meditation, not merely of death, but of annihilation, the precept *know thyself* has become transformed into the terrific oracle to Œdipus: 'Mayest thou ne'er know the truth of what thou art.'"

While Romanes pursued his scientific work unswervingly, completing works on *The Mental Evolution in Man*, *The Mental Evolution in Animals* and *Animal Intelligence*, and beginning his *Darwin and After Darwin*; he wrote several essays bearing on religion. They are:

1. "Mind and Motion." A lecture, published in *The Contemporary Review*, July, 1885, p. 74.

2. "The World as an Eject," published in *The Contemporary Review* in 1886, p. 44.

3. "The Evidence of Design in Nature," a paper read before the Aristotelian Society in 1889, and published in its proceedings as a contribution to a Symposium.

4. Three articles on the "Influence of Science Upon Religion," written in 1889, but remaining unpublished for unknown reasons.

In these essays Professor Romanes takes an unequivocal stand on the ground of monism, yet when he comes to the question of theism he assumes an attitude of agnosticism which does not venture to decide the problem but "leaves a clear field of choice between theism and atheism." The secret reason of his position which probably was hidden from his own mind was in our opinion this: he felt instinctively that there was some truth in theism, yet he could not discover by his reasoning powers what it was. He saw the errors

of the narrow church-theism, but he did not venture to broaden his idea of God so as to conform it to his better scientific insight.

Professor Romanes in 1892 sent us a copy of his article "The World as an Eject," suggesting its republication by The Open Court Publishing Company, which for reasons too long to enumerate we had to refuse. Professor Romanes's world-conception coincided with the monism of *The Monist* in all important points except in one —his agnostic reservation of leaving the question of theism undecided. I could not republish his essay, but I took the occasion to discuss our differences in an editorial article (which appeared in Vol. III, No. 2, pp. 249–257 of *The Monist*) hoping that he would either refute my strictures and fortify his arguments or alter his position which appeared to me half-hearted and untenable, and adopt a more scientific God-conception. At that time Professor Romanes's health broke down and I did not consider it proper to urge a reply from him before he would have thoroughly recovered. He went in the winter of 1892–1893 to Madeira, and it is probable that he never read what I had to say about his agnostic view of theism.

The agnostic reserve of Professor Romanes's position might have easily appeared to his readers as an unwillingness to decide a dilemma, which, whatever horn he chose, could only implicate him in troubles of various kinds; but the fact is that he was sorely perplexed in his own mind. On the religious problem all his sympathies were enlisted against his rational faculties, and he saw no other hope for the defence of the faith which he so dearly but vainly longed for, than by denying his rational faculties the right to have anything to say in the matter, and this, his attitude, he called, in distinction to the Spencerian agnosticism, "pure agnosticism."

Between the lines of Romanes's *Thoughts on Religion* we can see the distress of his soul. What a poor evidence is agnosticism! It is like a straw to which a drowning man desperately but vainly clings. For it goes without saying that agnosticism of every color is equally favorable to dogmatic Christianity to Mohammedanism, Brahmanism, theosophy, and mysticism of any description, as to Freethought and Nihilism.

With such sentiments Professor Romanes pondered in the last

year of his life on the problems of theism, faith, free will, the existence and origin of evil, causation and creation, regeneration, revelation, the miracles, Christian dogmas, such as the trinity, and incarnation, the fall of Adam, and Christian demonology. The notes which he wrote down on these topics a few months before his death were originally intended to counteract or offset in a measure, to his own or other people's satisfaction, the propositions contained in the *Candid Examination of Theism by Physicus*. He expected to work out a book on the subject which should appear under the title *A Candid Examination of Religion by Metaphysicus*, for he had found in the metaphysical *x* the sole place of safety for the God of Christianity. After his death the notes were handed to the Rev. Charles Gore, Canon of Westminster and a friend of the deceased scientist, who was to do with them what he thought best. Canon Gore has decided upon their publication together with other materials and his own editorial comments, and the book lies now before us under the title "*Thoughts on Religion*, by the late George John Romanes, Edited by Charles Gore, M. A., Canon of Westminster."

The book contains:

1. Two essays by Romanes on the "Influence of Science Upon Religion," written in 1891, the third essay being omitted, because, as the editor declares, "Romanes's views on the relation between science and faith in revealed religion are better and more maturely expressed in the notes" (pp. 37–88).

2. The Notes for a work on A Candid Examination of Religion (pp. 91–183).

3. Editorial Comments. Both parts open with editorial prefaces (pp. 5–33, p. 105, and pp. 91–96), and the whole book closes with a "Note by the Editor" (p. 184).

Mr. Gore claims that "both Essays and Notes represent the same tendency of a mind from a position of unbelief in the Christian revelation toward one of belief in it" (p. 6); and although Romanes's conviction cannot be described as "a position of settled orthodoxy," although he did not recover "the activity or habit of faith," we are told (on p. 184) that he yet "returned before his death to that full, deliberate communion with the Church of Jesus Christ

which he had for so many years been conscientiously compelled to forego."

There are people who think that there is no salvation except in the Church. For their benefit be it stated that such a man as Professor Romanes was in the darkest days of his boldest scepticism a better Christian than many a minister and preacher, who finds no difficulty in avowing allegiance to the thirty-nine articles of the Anglican Church.

* * *

We attach to the book a great importance, for it proves the depth of Romanes's religious sentiment. There may be a doubt whether it was wise and just to publish the notes—just toward the sacred memory of the deceased ; and we feel sure that many friends of the late Professor Romanes will regret the appearance of the booklet, for the notes are quite unfinished and incoherent. Indeed, the looseness of argumentation indicates that their author, when he penned them, was no longer at his best. Nevertheless, we believe Canon Gore was right in not withholding them from the world, because Romanes was great enough even for his weaker productions to command a general interest, the more so as they throw a searchlight into the most secret recesses of his innermost soul ; and it is of interest to us to know not only how a man like Romanes argued but also what he longed for and on what side his sympathies were most strongly enlisted. Taking the notes as they stand, and bearing in mind that their author's life was cut short before he could revise them and work his way out from the narrowness of agnosticism into a clear comprehension of the glory of true religion, we take them as witnesses of Romanes's deep love of God, whom he still harbored in his heart after his mind through scientific investigations had lost belief in his existence.

We can now understand what an abyss of desolation lies in the question which Romanes uttered in the concluding chapter, page 418, of the first volume of *Darwin and After Darwin*, "Where is now thy God?" And his answer bids us be resigned. He says : "And when the cry of Reason pierces the heart of Faith, it remains for Faith to answer now as she has always answered before—

and answered with that trust which is at once her beauty and her life,—Verily, thou art a God that hidest thyself."

Concerning Professor Romanes's progress from a position of unbelief toward one of belief, we are unable to discover any evidence of great consequence. For the agnostic position as the sole refuge for believers is already indicated in the *Candid Examination of Theism*. Even here Romanes says:

"Although the latter deductions have clearly shown the existence of Deity to be superfluous in a scientific sense, the formal considerations in question have no less clearly opened up beyond the sphere of science a possible *locus* for the existence of Deity; so that if there are any facts supplied by experience for which the atheistic deductions appear insufficient to account, we are still free to account for them in a relative sense by the hypothesis of Theism. And, it may be urged, we do find such an unexplained residuum in the correlation of general laws in the production of cosmic harmony."

On the other hand, instead of retracting his opinions in the Notes, Romanes expressly retained them, only proposing several important modifications and limitations. While he feels that "further thought has enabled" him "to detect serious errors or rather oversights," in his book he still thinks "that from the premises there laid down the conclusions result in due logical sequence." He continues, "as a matter of mere ratiocination, I am not likely ever to detect any serious flaws, especially as this has not been done by anybody else during the many years of its existence."

Romanes finds two faults with his former work: undue confidence in merely syllogistic conclusions, and a lack of care in examining the foundations of his criticism. He says:

"The metaphysics of Christianity may be all false in fact, and yet the spirit of Christianity may be true in substance—i. e. it may be the highest 'good gift from above' as yet given to man."

How true! But granted that it is true, should we not rouse ourselves to investigate what is the spirit of Christianity so that we may do away with its false metaphysics? Professor Romanes turns for help at the wrong door. Agnosticism, even Professor Romanes's "pure agnosticism," will never make us take heed and beware of the leaven of the Pharisees and of the Sadducees; and agnosticism,

if we are willing to believe, makes us credulous, while if we are unwilling to believe, makes us indifferent, for what is the use of our troubles if the truth lies in some superscientific field, where we can never hope to approach it.

Passing by the comments on Adam and the Fall, the blindness of reason with regard to the doctrines of the Incarnation and the Trinity and similar utterances,—topics the serious discussion of which we should not expect from the author of *Darwin and After Darwin*,—we think that the weakest parts of Professor Romanes's arguments are his contradictory applications of his principle of pure agnosticism. In one place he complains about "*professed*" agnostics who refused to go to a famous spiritualist, or to test the art of a mind-reader, and he says of them that they violated their philosophy by their conduct (p. 109), yet when dogmatic questions appear, such as whether Jesus was the son of God, he argues that we are, *qud* pure agnostics, logically forbidden to touch them (p. 106 and *passim*).

After all, Professor Romanes makes less use of his agnosticism than appears consistent and attempts a reconciliation between religion and science. He says:

"I intend to take science and religion in their present highly developed states as such and show that on *a systematic examination of the latter by the methods of the former*,[1] the 'conflict' between the two may be not merely 'reconciled' as regards the highest generalities of each, but entirely abolished in all matters of detail which can be regarded as of any great importance."

The principle of deciding the conflict between science and religion by "a systematic examination of the latter by the methods of the former" is the fundamental contention of that aspiration which we have defined as the "Religion of Science." In full agreement with the maxim of the Religion of Science, Romanes insists upon theists abandoning all the assumptions of which they have been guilty, saying:

"True religion is indeed learning her lesson that something is wrong in her method of fighting, and many of her soldiers are now waking up to the fact that it is here that her error lies—as in past times they woke up to see the error of deny-

[1] Italics are ours.

ing the movement of the earth, the antiquity of the earth, the origin of species by evolution, etc."

The only possible condition to fighting, says Romanes, lies in the distinction between the natural and the supernatural—a distinction that has always by both sides been regarded as sound (p. 121). He now proposes to rescind the boundary line that separates the supernatural from the natural and says: "Once grant that the supernatural is 'natural' and all possible ground of dispute is removed."[1]

This is the reconciliation between religion and science which we propose, and it may be formulated in analogy with Christ's words: "Render unto Science the things that are Science's!"

* * *

There are many more things that ought to be said, but they are of less importance, and we can only lightly touch upon some of them in a few disconnected remarks.

We believe that Romanes's distinction between Huxley's and Spencer's agnosticism is neither clear nor correct (p. 108). Professor Huxley's agnosticism is not what Romanes defines it, viz., "an attitude of reasoned ignorance touching everything that lies beyond the sphere of sense-perception." Mathematics lies beyond the sphere of sense-perception, yet Huxley does not extend his agnosticism to mathematical methods or conclusions.

The fact that St. Paul's epistles are regarded by the critics as genuine is mentioned three times (pp. 155, 168, 169), and it is claimed that this is "enough to show the belief of Christ's contemporaries" (p. 169). Indeed! But what of it? Have we not sufficient evidence of the belief of our own contemporaries in the various Christs who have risen among us? Schweinfurth and Teed are living in our midst, and the authenticity of their publications cannot

[1] Compare on the supernatural such passages in *The Monist* editorials as Vol. V, No. 1, p. 99: "We deny the existence of the supernatural in a dualistic sense; but suppose we call such higher features of nature as appear in man's ethical aspirations hyperphysical or supernatural because they rise above the lower and purely physical elements of the universe, we must confess that the supernatural lies hidden in the natural and is destined to grow from it according to the cosmic law of existence."

be doubted. The important question is not whether or no Paul wrote his epistles, but whether the ethics of the epistles is good or bad, and, granting that Paul said many noble things, I yet wish to see the orthodox clergyman who would venture to defend Paul's low, not to say vulgar, conception of marriage![1]

Romanes speaks of "some superadded faculties of our mind," explaining them in one place as "the heart and the will," as the "religious instinct," and other moral sentiments, and also as "spiritual intuition," or an "organ of spiritual discernment." He glories in the "infinitude of mystery sufficient to satisfy the most exacting mystic." We say, that the "superadded faculties," which are such as man's conscience, his religious aspirations and moral ideals, do not lie without the pale of scientific investigation. On the contrary, the better we understand their nature, the greater is their chance of nobler development and purification.

Such phrases as "first cause" and "infinite mind," which are word-combinations without sense, abound unduly in the notes and help not a little to increase the difficulties which present themselves to the mind of Romanes and which have become sufficiently bewildering through the sensitiveness of his religious nature.[2]

Romanes gave a great deal of his thought to the problem of the existence of pain in the world. How is it possible that God, if he be good, can allow his creatures to be hopelessly exposed to "hideously cruel" and terrible sufferings? Romanes says in his second essay on "The Influence of Science Upon Religion," after

---

[1] "The sole motive for marriage which St. Paul proposes is, 'It is better to marry than to burn.' The holiest instincts that would induce men and women to join their fates in a sacred alliance are utterly ignored. Nothing is said of the mutual sympathy and friendship that bind soul to soul much more closely than sexual appetites. No consideration is taken of the children to be born, and the very lowest desires alone are given as an *excuse* for entering into the state of matrimony, the holiness of which St. Paul does not understand. His view of marriage proves that he had no right conception of the ethics of human sex-relations. We admire St. Paul in many respects, but we must say that his view of marriage is un-Christian; it is unworthy of his sacred office as an apostle; it is a blemish in our Bible."—*Science a Religious Revelation*, pp. 11–12.

[2] For an exposition of the errors which lie concealed in the phrase "first cause," see *Primer of Philosophy*, pp. 146–147, and *Fundamental Problems*, p. 88 et seq. As to "infinite mind," see *Homilies of Science*, p. 102 et seq.

speaking of the agonies of a rabbit panting in the iron jaws of a spring trap:

"What are we to think of a Being who, with yet higher faculties of thought and knowledge, and with an unlimited choice of means to secure His ends, has contrived untold thousands of mechanisms no less diabolical? In short, so far as Nature can teach us, or 'observation can extend,' it does appear that the scheme, if it is a scheme, is the product of a Mind which differs from the more highly evolved type of human mind in that it is immensely more intellectual without being nearly so moral."

The problem of the existence of pain in the world is an unsolvable mystery on the hypothesis of the traditional theism, and no theory of "probation" can satisfactorily explain the difficulty. But Romanes declares that, after all, we are not bound to adopt the idea of a "carpenter-God," as Mr. S. Alexander calls the anthropomorphic notion of a Creator (see p. 94), which implies that the world-order is "a scheme."

As to God's responsibility for pain, we should bear in mind that one of the most obvious features of anthropomorphism in the God-idea is the attribute of "moral goodness." In the same way that God is not an individual being, that he is not a huge ego or person like ourselves, but a superpersonal omnipresence, so he is neither moral, nor good, nor ethical; for God is the standard of goodness; he is the norm, conformity to which is the condition of ethics; he is the ultimate authority of all moral conduct. He is neither moral nor immoral, but unmoral, or let us say "supra-moral." If God were the carpenter of the world, he would be responsible for its laws and arrangements, including all the cruelties implied by them, and he could not escape the condemnation of immorality.

Romanes has found the right answer when he says:

"For aught that we can tell to the contrary, it may be quite as 'anthropomorphic' a notion to attribute morality to God as it would be to attribute those capacities for sensuous enjoyment with which the Greeks endowed their divinities. The Deity may be as high above the one as the other—or rather perhaps we may say as much external to the one as to the other. Without being supra-moral, and still less immoral, He may be un-moral: our ideas of morality may have no meaning as applied to Him."

Such was Romanes's pious disposition of mind, that, if it ever

had been possible to defend the old traditional dogmatism before the tribunal of reason, he would have done so, and we can repeat the quotation from Virgil, which D. F. Strauss applied to Schleiermacher, without hesitation of Romanes:

"Si Pergamum dextra defendi posset
Hac certe defensa fuisset!"

* * *

There is one more point to be mentioned. Professor Romanes adopted the idea so often proclaimed in the pulpit, that "no one can 'believe' in God, or *a fortiori* in Christ, without also a severe effort of will," and he adds:

"Yet the desire is not strong enough to sustain the will in perpetual action, so as to make the continual sacrifices which Christianity entails. Perhaps the hardest of these sacrifices to an intelligent man is that of his own intellect. At least I am certain that this is so in my own case.

Romanes rummages his brain for arguments to silence the voice of reason. He says (p. 167):

"The force of Butler's argument about our being incompetent judges is being more and more increased.

"The unbiassed answer of pure agnosticism ought reasonably to be, in the words of John Hunter, 'Do not think; try.'"

And he tried! What tortures must this man have suffered in his eagerness not to think but to believe! His religious struggles may have been the physical cause of his premature death; for distraction of mind is more injurious than overwork. And after all he was anxious to attempt the impossible. We read on pp. 132–133:

"Yet I cannot bring myself so much as to make a venture in the direction of faith. For instance, regarded from one point of view it seems reasonable enough that Christianity should have enjoined the *doing* of the doctrine as a necessary condition to ascertaining (i. e. 'believing') its truth. But from another, and my more habitual point of view, it seems almost an affront to reason to make any such 'fool's experiment'—just as to some scientific men it seems absurd and childish to expect them to investigate the 'superstitious' follies of modern spiritualism. Even the simplest act of will in regard to religion—that of prayer—has not been performed by me for at least a quarter of a century, simply because it has seemed so impossi-

ble to pray, as it were, hypothetically, that much as I have always desired to be able to pray, I cannot will the attempt."[1]

Is it not a shame on our Church dogmatism to let a man like Romanes, an intellectual giant torture himself, on the rack, in efforts to conform to the religion which he had been taught to love with all the fervor of his soul?[2] Professor Romanes imagined that God requested from him the sacrifice of his intellect, and what was he not willing to do for God's sake! As Abraham went out to sacrifice his only son Isaac, so Romanes seriously tried to slaughter his reason on the altar of faith.

My blood begins to boil at the thought, for I remember my own experiences and the dark hours of despair in which I had, against my own will, lost my God and my religion, and felt all the miseries of hell. However willing I was to sacrifice my vanity, my egotism, my pride, my pleasures and joys, my self and my fondest hopes, I was yet unable to surrender my better knowledge, and only after many hours of sore trial did I work my way out again into the glorious liberty of the children of God. I came to the conclusion that no such sacrifice is expected of us as a surrender of our intellect; for our intellect is but the reflexion of God's nature in our soul. Man's reason is the light of his life; it is a product of that world-logos which science traces in all natural laws, and it is the seal of man's divinity which constitutes his similarity to God.

---

[1] Kant condemns "the *prosopopœia*," or face-making, of "hypothetical" prayer as hypocrisy, and says: "The consequence of this is that he who has made great moral progress ceases to pray, for honesty is one of his principal maxims. And further, that those whom one surprises in prayer are ashamed of themselves."

[2] How true is what Mach says of the conflict between science and theology! In his *Science of Mechanics*, p. 446, we read: "It would be a great mistake to suppose that the phrase 'warfare of science' is a correct description of its general historic attitude toward religion, that the only repression of intellectual development has come from priests, and that if their hands had been held off, growing science would have shot up with stupendous velocity. No doubt, external opposition did have to be fought; and the battle with it was no child's play. But investigators have had another struggle on their hands, and by no means an easy one, the struggle with their own preconceived ideas." Professor Romanes is the most modern instance of the severity of the conflict which often distracts the soul of a scientist. Oh, what a noble mind was here o'erthrown—and by what? By his devotion to dogmas, the spirit of which he felt to be true, and the allegorical garb of which he knew to be full of errors.

What is the lesson of Romanes's *Thoughts on Religion*?

Romanes's posthumous work is a *mene tekel* which reminds us of the importance of the religious problem. We cannot and must not leave it unsettled in worldly indifference. We must attend to it and investigate it bravely and conscientiously. We can no longer denounce reason or silence our intellectual needs, for it is God himself who speaks in the voice of reason; and the progress of science is his most glorious revelation which ecclesiasticism cannot smother. Indeed, the suppression of reason is the sin against the Holy Ghost which cannot be forgiven but will inevitably lead, if persisted in, to eternal perdition.

The sad case of Professor Romanes's religious struggles reminds us of the significant words of the late Field-Marshal von Moltke who, with reference to dogmatic religion, says in the posthumous, deeply religious "Thoughts of Comfort," which contain his confession of faith: "I am afraid that the zealot in the pulpit, who will persuade where he cannot convince, preaches Christians out of the church."

Our church Christianity is not as yet free from paganism. By paganism we understand a belief in the letter of parables or allegorical dogmas to the detriment of their spirit; and tradition and habit combine to make our theologians worship the letter that killeth. A one-sided training warps their judgment. Their notions of God, the sacraments, miracles, inspiration, prayer, Christ's sonship, and other religious ideas are, as a rule, more pagan than they themselves are aware of. The constitutions of most churches are so formulated as to make a belief in the literal meaning of symbols the test of orthodoxy, and Christians are urged to set their trust upon myths. For the higher education of the clergy we would propose, therefore, that every theologian should study at least one of the natural sciences or mathematics. It would be the best way, perhaps the only way, to teach them the sternness of truth and to dispel their anthropomorphic notions of God.

The narrowness of ecclesiasticism has estranged many noble minds from religion. Let our clergy see to it that room be made for intellectuality in our churches; and the light of science will purify

the dark corners in which the superstitions of past ages still continue to exercise their baneful influence.

Romanes has much to say of the inner voice, intuition, and inspiration, but whatever form the subjective instincts of our religious nature may take, they possess merely preliminary power of decision and have no authority in comparison with objectively demonstrable truth. The verdict of conscience is very valuable, because it frequently reveals deep moral truth in a prophet's vision: yet is it neither absolute nor reliable, for it must seek its ratification before the tribunal of science. So far as human evolution has gone, science alone is possessed of that catholicity which is so sorely needed in religion.

There is no peace of soul for him whose religion has not passed through the furnace of scientific criticism, where it is cleansed of all the slag and dross of paganism. If God ever spoke to man, science is the fiery bush; and if there is any light by which man can hope to illumine his path so as to make firm steps, it is the light of science. Let us, therefore, make religion scientific and science religious. Let us, on the one hand, imbue religion with the spirit of science, with its rigorous criticism, strict exactness, and stern devotion to truth; and on the other hand, let us open our eyes to the moral and religious importance of the results of scientific inquiry. The ultimate aim of science is to reveal to man the religion of truth.

Let the light of science illumine both our minds and our sentiments; for science is holy, and the light of science is the dwelling-place of God.

EDITOR.

THE SIGNIFICANCE OF MUSIC.

THE philosophy of music is a much neglected field, although it is both important and interesting. The probable reason is that philosophers are rarely musicians, and few musicians are philosophers. Philosophers, as a rule, ignore music altogether, as if they had no time for inquiring into its nature, or as if music were of too little consequence to receive a place in the economy of their system. Musicians, on the other hand, speak of their art with enthusiasm, and, as a rule, fail to explain the real problem that it presents. Their reflexions, however, constitute an important material for the investigator who would attempt to sound the problem in its full depth, both in its physical conditions as investigated by Helmholtz, and in its æsthetic aspirations so ably discussed by Hanslick and Wollascheck.

Mr. C. Crozat Converse is well known in the musical world not only as a musician of high standing but also as an author and a judge of musical performance. He is the composer of several orchestral works which have been performed by Gilmore in Boston, Thomas in Chicago, and Seidl in New York. His reputation alone entitles him to a hearing and we take pleasure in presenting to our readers an article from his pen, although we are not prepared to accept his theories of the mother-tone A and the all-importance of onomatopy. We are reluctant to speak on the subject for we feel we are trespassing on foreign ground, and confess that Mr. Converse in all matters musical is unquestionably our superior. With all due deference to the value of the propositions made by a master musician, it may not be amiss to present some suggestions of our own—a boldness in extenuation of which we can only say that

our remarks come from one whose inability as a practical musician is atoned for by a passionate love of music.

About a century ago a prophet arose in the person of Abbé Vogler, who promised to reveal the secret of music, which was regarded as a universal language, as painting in sounds, as liquified architecture, or as an imitation of nature in its tenderest sentiments. Abbé Vogler, son of a violin-maker, had imbibed the elements of music almost in babyhood and played several instruments, especially the violin and the organ, to perfection. An inventor of mechanical improvements of musical instruments, a composer, a brilliant virtuoso, and a man of broad education, he seemed to embody all the essentials that entitled him to speak on the subject. He travelled about Europe and gave concerts for which he had programmes printed that contained explanations of his music. It was delightful for the audience, for it was music made easy even for unmusical people. His auditors read the explanatory notes during the performance and everybody knew what it meant. The universal language so difficult to understand was interpreted and Abbé Vogler's method met with unprecedented success, especially in the fashionable circles of the royal courts. He was honored as never composer had been honored before, and even in poetry his name has been immortalised. He found his Homer in Browning.[1]

And yet Abbé Vogler has been forgotten and his method is abandoned. The reason is that it is wrong. Music is no imitation of nature; it is no language either particular or universal; it is no painting, no liquified architecture; nor is architecture frozen music. Music is a constructive art, the elementary materials of which are very simple, and the attempt to make it representative of nature, as we perceive it with our senses, is a by-path which leads us astray.

Music is among the arts what arithmetic is among the sciences: as arithmetic is among all formal sciences the most purely formal science, so music is among all arts the most abstract art. Music consists in numerical relations. There is no music but can be expressed in numbers.

[1] See Browning's well-known poem "Abt Vogler."

I do not intend here to trace out the analogies between music among the arts and arithmetic among the sciences, but it seems to me that the same difficulties beset the philosophical explanations of both, and that the same causes have prevented philosophers from seeing the simple truth and expressing it in simple terms. There are in music two parties, the advocates of the onomatopoetic style and the believers in pure music; there are the romantic and the classic schools, opposed to each other, just as are the empiricists and apriorists in the philosophy of the formal sciences, and peace can be made between the two in somewhat the same way as we have attempted to do in the last case by pointing out where in experience the roots of the *a priori* lie buried.[1]

The sciences are limited to fewer and ever fewer thinkers according to the degree of their abstractness, but among the arts, the more abstract an art is the more generally it is appreciated. Music, the most abstract art, may claim universality, for even inanimate things are affected by it, as we may see when repeating Chladni's experiments with sand-covered glass plates. The effect of music on man, accordingly, is quite complex and it is also very diversified in different individuals. It may penetrate only the physical and physiological constitution in some people; in most it reaches the psychical, but only in a few the intellectual plane of their nature.

The basis of music is rhythm, which is a regularly accented progress in time. No music is possible without rhythm. The loss of rhythm would render the most euphonious sounds or tones unmusical. Birds' music is not music in the proper sense of the word, and the introduction of a piping nightingale or other chirping songsters, in an orchestra, is an allowable transgression, not less so than for instance the whistle of a steam-engine and the tolling of bells in a *potpourri*, popular during the first exhibition of Paris, and which, if I am not mistaken, was called "All Around the World."

The historical beginning of music among savages is the clapping of hands, the stamping of feet, and the beating of drums; and how powerful mere rhythm is or can be, no lesser man than Beet-

---

[1] See the *Primer of Philosophy*, pp. 81–88.

hoven, the philosopher among musicians, proves to us in the ninth symphony in D major (opus 21), of which Grove says:

"For an instant one listens almost in doubt whether it has really begun. Until Beethoven's time, the drum had, with rare exceptions, been used as a mere means of producing noise—of increasing the din of the *fortes*; but Beethoven, with that feeling of affection which he had for the humblest member of the orchestra, and which has made him (in this concerto and elsewhere) give independent passages to the horn or the bassoon, which have immortalised those intruments—has here raised the drum to the rank of a solo instrument. And not only that, but these four notes of the drum, like the first rays which herald the sun, give a color and individuality to the whole of this great and radiant movement. These four notes are heard all through it—their broad noble rhythm pervades the whole—now in the fiddles, now in the horn, now in the trumpet, now in the full orchestra—always characteristic, always impressive, always the pivot upon which some unexpected enrapturing change takes place, or some new appearance of the theme or the solo instrument is to turn."[1]

While rhythm is the strength of music and its backbone, pitch is its beauty; and pitch again is representable in numbers. The physical conditions of pitch are the number of air-waves which vibrate in a given time. The increase and decrease of these vibrations, or, as we are wont to say, the rising and falling of the notes, is indicated in our musical notation by the higher or lower position of the notes on or above or below the five lines; but pitch, like rhythm, can be expressed in numbers.

Grassmann[2] and Helmholtz have proved that what we call the timbre, or *Klangfarbe*, of sounds, which is that peculiar acoustic coloring possessed by the sounds of the various instruments, such as violins, trumpets, harps, pianos, the human voice, etc., is due to accompanying sounds which vary according to the medium by which the tone is produced; and it is theoretically possible to express all the differences of timbre of orchestral music in numbers.

Rhythm and pitch combined constitute melody which is full-

[1] Reproduced from the programme of the Beethoven Concert given in the Auditorium at Chicago, May 4, 1894, under the direction of Theodore Thomas.

[2] Grassmann published his researches before Helmholtz in a gymnasial programme of the Marienstift, Stettin; but as this method of publication was very ineffective, and Helmholtz was more popular and better known, Grassmann is rarely credited with the priority of the discovery.

fledged music, and the additional element of harmony renders it more complex and more beautiful. Harmony, however, like rhythm and pitch, can be expressed in numbers. The beauty of harmony consists in a certain regularity of arithmetical proportions among the numbers of the various air-vibrations.

There is a peculiarity about music which is that a musician need know nothing about the physical conditions and arithmetical relations, for he perceives them directly and immediately. Music is, so to say, an intuition of the ear. It is the cognisance of a world of most delicate phenomena anterior to any reasoning or mental comprehension. The ear feels the consonances and dissonances in all their details without having any idea of the nature of their general cause.

Among the few philosophers who have discussed music Schopenhauer's theory deserves to be specially mentioned, in so far as he has exercised an uncommon influence upon the musical development of modern times. Wagner is one of Schopenhauer's most faithful disciples, who, in his greatest dramatic work, the trilogy of the *Nibelungen*, goes so far even as to make the longing for extinction his main theme and dominant *Leitmotiv*, giving expression to the most negative conception of the Nirvâna-idea, which Schopenhauer finds realised in the utter negation of the will.

Schopenhauer's conception of music is, that although it is related to the world as the representation to the thing represented, it is, nevertheless, not an imitation of nature in any of its various phenomena, but a copying of the will itself, who is the creator of nature and its metaphysical condition, the thing-in-itself. Thus he traces, if not a likeness, yet a parallelism between music and the manifestations of the real world. He says:

"I recognise in the deepest tones of harmony, in the bass, the lowest grades of the objectification of will, unorganised nature, the mass of the planet. Further, in the whole of the complemental parts which make up the harmony between the bass and the leading voice singing the melody, I recognise the gradation of the ideas in which the will objectifies itself. Those nearer to the bass are the lower of these grades . . . the higher represent to me the world of plants and beasts . . . lastly, in the melody, in the high-singing principal voice leading the whole and progressing with unrestrained freedom, in the unbroken significant connexion of one thought

from beginning to end representing a whole, I recognise the highest grade of the objectification of the will, the intellectual life and effort of man."

Schopenhauer repudiates the theory of a direct imitation of nature, and yet is his fault in theory the same as that of Abbé Vogler. However helpful the method of symbolising in music the various phenomena may be, and however suggestive the onomatopoetic aspirations may prove to composers, all these references of music to the surrounding world are foreign to its inmost nature. It is true that the very greatest composers were not free from attempts at imitating all kinds of natural events. Handel sought to express in music the Egyptian darkness. Haydn reproduced the effect of light in his oratorium, *Die Schöpfung*, in the passage *Es werde Licht und es ward Licht*; Beethoven reproduced in his *pastorale* scenes of idyllic life, a storm and the return of a rainbow-graced sunshine. Loewe, best known through his melodious ballads, in his *Auferweckung des Lazarus*, went so far as to indicate in tones the odors rising from the tomb. Granted that these composers produced grand and original music in the passages that were suggested by such ideas, we cannot say that they accomplished their intentions. We have to be told that these trumpets mean light and those drums imitate thunder. They may mean anything else; and Rossini's grand composition of *Stabat mater* might illustrate as much the triumph of a struggling hero as the tears of a mourning mother.

Music is a world of its own. It practically demonstrates to us that the real world of nature is only one actualisation among many possibilities. We can imagine that other universes existed which differ in kind from this in which we live. It may be built up without matter and without anything that deserves the name substance. Yet in order to be a universe it must be an exemplification of law. Music is the most perfect embodiment of purely abstract law. Nothing is more abstract than number, and musical forms reveal to our immediate apprehension nothing but numerical relations. Nevertheless, music is no arithmetic, and sonatas are no paradigms. Music is all through aglow with sentiment, and it is well known to be the most effective means of rousing and laying the passions of our heart. And why is that? Because if we could analyse all the

throbs of our life, we would find nothing but motion. Our pulse is rhythm, our breathing is rhythmic, our walk and all our doings, our loves and hates, our hopes and fears, our pains and pleasures, in a word, all our emotions are rhythms that are scanned in the vibrating functions of the organs of our body.[1] Our physical life, in all its details, is a sonata which we perform without being able to hear its music. We know nothing of the metre, we only feel it, or, better, our life-actions are the changeful metre itself, and we live on in its perpetuation and constant repetition.

As a musical sound agitates a chord whose note corresponds with it, and rouses its slumbering note, so the music of sentiment that lies concealed in the rhythm of our life responds to the songs and sonatas of the composer as it happens to find our organisation attuned to their reception, and the soul re-echoes the appeal of melodies according to the rhythms that are awakened in the delicate fibres of its most secret life.

EDITOR.

---

[1] The all-importance of rhythm is very forcibly shown in Professor Billroth's posthumous essay, "Wer ist musikalisch?" published by Eduard Hanslick in the *Deutsche Rundschau*, Vol. 21, No. 1 (Berlin, 1894).

THE KEY TO THE RIDDLE OF THE UNIVERSE.

A DISQUISITION ON MR. EDWARD DOUGLAS FAWCETT'S PHILOSOPHY.

MONADOLOGY is a philosophical system based upon a psychological hypothesis that is now almost universally regarded as antiquated. Its greatest representatives were Leibnitz and Herbart, but there are only a few disciples of Herbart now left in Germany, among whom O. Flügel and Ed. Dillmann[1] are the most active and best known, while in England a new and able champion of monadology has arisen in the person of Mr. E. Douglas Fawcett.

That a theory is considered antiquated is no reason why it should not be revised and tried again, but the trouble with monadology is that it renders the facts for whose explanation it is invented, more mysterious and complicated than they naturally are. The problem is solved at the sacrifice of a number of new problems, the solution of which is a hopeless task, and the sole comfort lies in the consideration that having transcended the boundary line of physics, we are moving in the fairy-tale realm of metaphysics, where physical experiment and proof is dispensed with and speculation can be indulged in without fear of the pruning-hook of criticism.

Mr. Fawcett is a scholar who is well read in the history of philosophy; his command of language is excellent, and some of the new terms which he has invented are very forcible. But the abler the defence the more obvious becomes the gratuitousness of the monad-

[1] See O. Flügel, *Die Seelenfrage*, and Ed. Dillmann, *Darstellung der Monadenlehre*.

ological assumptions. Indeed, the theory need only be worked out in detail to reveal the fallacies of its complicated metaphysical apparatus, and any student of the system, except perhaps its own inventor and some of his most ardent disciples, will lose confidence in the practicability of the scheme.

Among the arguments which are supposed to buttress the theory of monadology the strongest one is said to be found in the testimony furnished by our workaday consciousness. A subject is posited as the ground, source, and sustainer of our fugitive states of consciousness. Mr. Fawcett argues :

"No subject, no flux of sensations in time ; no subject, no order of sensations in space ; no subject, no memory, no expectation ; no subject, no introspection ; no subject, no explicit I-reference."—*Riddle of the Universe*, p. 265.

The subject is described as a monad, i. e., "a unitary individual centre of consciousness, actual or potential." (P. 337.)

Monads are described as atomic, and the chemical atoms appear to be monads of a lower order. The subject is the central monad in man's organism ; for there are also "ganglionic monads" and "a variety of states separately present in separate monads are mirrored as united in the glassy essence of the subject" (p. 314).

The monads, however, although called the well-springs of reality, have themselves sprung from a universal subject which is the impersonal *prius* of existence and the ground of all reality whatever. This *prius* is neither conscious nor unconscious, but metaconscious, whatever that may mean, and in it "individuals can hang side by side without mixing."

The sciences, especially physics, chemistry, and psychology, will have to be rethought from the standpoint of the metaphysics of monadology; such "well-attested phenomena," as clairvoyance, thought-transference, and telepathy, which bewilder a materialistic science, fit in easily with Mr. Fawcett's doctrine, and new light is promised on old problems, especially in the domain of evolution. Mr. Fawcett says :

"The universe is made up of individuals of various grades, its development is the expression of their development, and this, again, rests on their mutual further-

ances and hindrances as variously related. This necessary change of relations is the key to the riddle. . . . *The humblest atom-monad undergoes a ceaseless palingenesis.* When hydrogen-monads 'combine,' as we say, with oxygen-monads as H_2O, they have *special overt states* answering to these special relations; when, again, they occur in H_2SO_4, they have *other overt states. Now, these two sets of states of the hydrogen monad answer to what for the human Monad would be two life-dreams, or two separate 'rebirths,' and the known shift of its relations* is *Palingenesis on the lowest level.* Not only, therefore, can palingenesis be deduced from the doctrine of the Metaconscious, but in the case of the *lower* monads it can, also, to a great extent, be experimentally verified.

"Save in respect of *complexity*, Palingenesis, as here conceived, is exactly the same affair for the higher human monad as it is for an atom of hydrogen—a change of the relations of monads. We are thus led to regard the universe as in last resort an aggregate of palingenetic individuals, the unfolding of which constitutes the Evolution of Deity."

The difficulty over which Mr. Fawcett stumbles is the problem of the origin of the ego-perception, which appears to him as the condition of the continuity that obtains in memory and forms the basis of our personality. He is more materialistic than he is aware of himself. He attempts to think the conditions of psychical unity as an actual being and endows it with a kind of substantial existence, which, however, in order to escape the absurdities of his materialistic procedure, he makes as small as possible, only preserving its indivisibility and individuality. The result is his belief in monads.

Mr. Fawcett will find that the problem of memory lies at the basis of the problem of personality, and psychical continuity is nothing but the preservation of form in the flux of metabolic changes taking place in a sentient organism. No subject-assumption is needed to explain the I-reference, nor to explain the recollection of past experiences or future expectations. A rational explanation of memory renders Mr. Fawcett's monadology redundant.

If our skin be cut, the wound will heal ere long; but a scar will be left, and the scar preserves the exact form of the wound. The material particles which constitute the skin are renovated again and again, but in all this flux of matter the form of the cut is preserved. Should, however, the atmosphere be charged with those abnormal tensions which prognosticate rapid changes in the weather, the irritation may be felt in the scar and may reproduce a weak repetition

of the pain of the old wound ; and no subject is needed to explain the phenomenon.

The evolution of organised life is a product of memory. Sentient substance reacts upon its surroundings and every reaction leaves a trace which is preserved, and which by repetition develops into an organ. Thus function creates the various forms of life which we call the souls of sentient beings, and the preservation of form means the preservation of soul.

Form is generally looked upon as a nonentity, but it is the form of a thing which makes it what it is. Form is the most essential part of reality, and the preservation of form means the immortality of life.

The key to the riddle of the universe lies in a correct comprehension of the nature of form. It is not accidental that the formal sciences (mathematics, arithmetic, logic, and pure natural science, which latter propounds and explains such truths as causality and the law of the conservation of matter and energy) are the mental tools of the scientist. Formal laws are always the ultimate explanations, and more mysteries are revealed by measuring and counting, which constitute the main methods of the sciences, than by monadological speculations. A correct comprehension of the nature of form, including a recognition of both the reality of form, and the sweeping importance of its preservation, which implies the immortality of the soul, will enable us to dispense with all materialistic theories of psychical and mental phenomena, it will teach us a spiritual conception of spiritual truths and throw light upon the great problems of life which confront us in problems of ethics and religion.

EDITOR.

BONNET'S THEORY OF EVOLUTION.

A SYSTEM OF NEGATIONS.[1]

"Truth emerges sooner from error than from confusion."—*Bacon*.

BONNET'S theory of evolution, it is well known, was radically different and even diametrically opposed to the theory of evolution as now commonly held; it was an absolute denial of new-formation, or epigenesis, and was based upon the idea of preformation in the sense of instantaneous original creation. This is an historical fact which should not be obscured by the distinction which has lately arisen between those who maintain and those who deny the inheritance of acquired characters—between the Lamarckians and the Weismannians. The new idea of preformation opposes only that one-sided epigenesis of recent date which insists that all true epigenesis is from without, and that all generation from within must bear the name "evolution." The distinction serves to set off the extreme Lamarckian school; but it is quite modern, and not opposed to the idea of true generation. There are, nevertheless, some biologists who imagine they see in certain recent theories of development a renascence of Bonnet's evolution theory. Are they not aware of the fundamental difference between the old and the new standpoints? Yet some of the advocates of epigenesis maintain that these distinctions vanish when we compare Bonnet's latest views with those now held by modern evolutionists. This claim has often been repeated of late, and I am aware that it is backed by eminent scientists, for whom I have the very highest respect. Among them is a no less revered authority than Professor Huxley, from whom I should not venture to differ except for reasons that seem indubitable.

---

[1] From the "Biological Lectures" at the Marine Biological Laboratory, 1894.

If Bonnet's theory of evolution had in it a truth of such vitality that it can rise, phœnix-like, from the ashes of its supposed demolition; or, to state it in a more conventional form, if our theories of development are carrying us back to the standpoint reached by the evolutionists of last century, it is a matter of more than historical interest. The issues that now lead embryological research are involved. Our ideas of development, the landmarks already passed, the cardinal points in our present horizon, our tendencies are all brought under the rubrics of comparison. Any mistake here must obscure the general situation in just those points where it most needs to be clearly defined.

Our chief concern is with standpoints. Compared with them, theories are of little consequence. The standpoint sets the limits to our horizon, and so determines the reach and range of vision. It is the vantage-ground of progress, the conquest of laborious research, of which one might say, as Johannes Müller once said of his own work: "*Es klebt Blut an der Arbeit.*" We have to deal, then, with a question of moment, and one which presents, in addition to its inherent difficulties, the obstacles raised by prejudgment. Let us try to clear the ground a little, so as to get into closer touch with the question.

One fact orients the whole field. It is the fact that we now build upon two broad truths which found their negation in the old theories of development, namely, *heredity* and *generation.* It may sound a little paradoxical, but it is true, that the two theories of last century not only contradicted each other, but also denied the very truths they came to explain. Evolution was the absolute negation of both heredity and generation, while epigenesis upheld generation, but denied organic continuity, the essential foundation of heredity. Let us make no mistake on this point, for it is fundamental and decisive as regards standpoints.

Both Bonnet and Haller boldly denied the possibility of generation. Why? For the obvious reason that generation meant epigenesis. There was no middle ground. If by any possibility anything of an organic nature could be referred to epigenesis, the miracle of creation would be reduced to the level of an every-day

occurrence. The backbone of the argument for *original* preformation would go to pieces if a single vertebra could arise epigenetically. Not so much as a supernumerary digit, or a monstrous organ of any description, troublesome as such things were to the preformationist, could be allowed to pass to the credit of epigenesis. Allow that a single organ can be formed anew, and the whole edifice of preformation would be irretrievably undermined. Bonnet saw the bearings and the perils of his theory, and he did all that ingenuity could do to guard the central idea against hostile attacks.

What that central idea was, and how the fate of the whole theory hung upon it, Bonnet makes clear in one of his earlier writings. Referring to the principles advanced in relation to the formation of the mule, Bonnet makes the following remarks, "prophetic of the event" already fulfilled on his own head:

"They [the principles] will always rest on *the importance of the pre-existence of the germ to fecundation. I admit, then, that if the falsity of this observation should ever be demonstrated, the edifice I have attempted to erect on that basis would be as ruinous as those I have undertaken to destroy.* Such is the natural fate which threatens analytical works; if we can but destroy the fundamental principle, and detach the main link from the chain, the whole work will be little more than a series of propositions which are more or less erroneous, and it can be looked upon in no other light than as a mere romance."[1]

That "the *pre existence of the germ to fecundation*" meant to Bonnet the pre-existence of a *completely formed* organism, and hence the denial of generation, is expressly stated in a previous paragraph.

"Mais si le germe préexiste à la fécondation, s'il n'est pas *engendré*; si des parties qui ne paraissaient point du tout exister *existaient réellement*, n'est-il pas fort probable que l'organe de la voix du mulet n'est pas engendré non plus?" (*Ibid.*, p. 59.)

Such is the burden of the argument throughout. Indeed, no one doubts that Bonnet *began* with a preformation so complete as to exclude generation, and that this idea was the centre around which the whole of his philosophy at first revolved. Did he ever abandon the idea, or modify it in such a way as to nullify the original dis-

[1] Preface to his *Contemplation of Nature* (1764); finally published as *Tableau des considérations*, as an introduction to the *Palingénésie philosophique*, Art. XII, p. 62 (1783).

tinction between his doctrine and epigenesis? Did he knowingly, or by any inadvertence, ever once drop the bars to epigenesis? If he did, then there may be some truth in the current opinion that the new evolution is a revival of the old idea as it was finally left by Bonnet. If he did not, either directly or by implication, then there can be no foundation for such an opinion. I believe this opinion is erroneous, and that it leads to confusion that is wholly mischievous.

What Professor Huxley has said on this point must be carefully noted, as I suspect that some writers have taken his words in a sense that somewhat betters the instruction.

After pointing out that the hypothesis of *emboîtement* is to be carefully distinguished from the hypothesis of evolution of a germ containing in miniature all the organs of the adult, Huxley makes the following statements:

"While holding firmly by the former, Bonnet more or less modified the latter in his later writings, and, at length *he admits that a 'germ' need not be an actual miniature of the organism; but that it may be merely an 'original preformation' capable of producing the latter.*

"But, thus defined, the germ is neither more nor less than the *'particula genitalis'* of Aristotle, or the *'primordium vegetale'* or 'ovum' of Harvey, and the 'evolution' of such a germ would not be distinguishable from 'epigenesis.'"[1]

Observe that Huxley does not here authorise the opinion that "evolutionists" are reviving the objectionable features of Bonnet's system. There is no suggestion of a retrograde movement on the part of embryologists. Indeed, it is very clear that Huxley saw in modern embryology the verification of the main contention of epigenesis, and the repudiation of both of Bonnet's hypotheses. But while claiming for epigenesis, a complete victory over the doctrine of evolution as understood in the eighteenth century, Huxley takes care not to sanction the idea that epigenesis contains the whole truth. In fact, he makes a suggestion that, to my mind, outshines "the divination of genius" ascribed to Harvey. The words already "proved a prophecy" are the following:

"It is not impossible that, when the analysis of the process of development is carried still further, and the origin of the molecular components of the physically gross,

[1]Article "Evolution," *Encycl. Brit.*, p. 745; *Darwiniana Essays*, 1893, p. 193.

though sensibly minute, bodies which we term germs is traced, the theory of development will approach more nearly to metamorphosis than to epigenesis." (*Ibid.*, p. 283.)

The movement here anticipated is not in the direction of the old evolution, but towards a view which represents the residual truth of both "epigenesis" and "metamorphosis." That part of the old epigenesis which started the germ as "*a sort of living precipitate*" *in a clear fluid* ("colliquamentum"), is of course set aside, and along with it the absurdities of Bonnet's idea of metamorphosis (change of external form without change of structure or substance).

In place of these errors are put the ready-made germ, with a structure received from the parent organism, impregnation by fusion of two germs, and development by a process of division. Evolution is viewed as:

"A course of progressive differentiation."

"A succession of changes of the form, structure, and functions of the germ by which it passes, step by step, from an extreme simplicity, or relative homogeneity of visible structure, to a greater or less degree of complexity or heterogeneity." (*Ibid.*, p. 199.)

Huxley says:

"From this point of view the process which, in its *superficial aspect* is epigenesis, appears *in essence* to be evolution, *in the modified sense adopted in Bonnet's later writings*; and development is merely the expansion of a potential organism, or 'original preformation,' according to fixed laws." (*Ibid.*, p. 204.)

The position here, so concisely sketched in 1878, is the one toward which opinion seems to be drifting. But while the philosophy is clear, the identification of it, or any part of it, with Bonnet's later views is, I believe, unwarranted by anything contained in Bonnet's writings. The comparison, if it be inadmissible, is all the more unfortunate for the sanction of an authority so universally respected. It has been taken for considerable more than its author would probably approve; for some have construed it against epigenesis, and others against evolution.

We should have no fault to find with the comparison if it were true, as Huxley seems to have supposed, that Bonnet finally adopted a definition of the germ which dropped the chief distinction between evolution and epigenesis, as understood in his time. I do not find

any such inconsistency between Bonnet's earlier and later definitions, and it is very certain that Bonnet never made any concession which, to his understanding, weakened in the least degree his idea of preformation. Is it probable that Bonnet tripped on so fundamental a matter without knowing it? Is it not more probable that Professor Huxley has put an interpretation upon his words which he would have most emphatically disputed? Is not the suicidal concession imputed to Bonnet, after all, merely an inference to which his words were liable, only when isolated from the context and construed to the mind of the reader rather than to the intention of the author?

Although the words "evolution in the modified sense adopted in Bonnet's later writings," might suggest, if they do not distinctly imply, that Bonnet finally resigned himself to a view hardly distinguishable from epigenesis; still I am inclined to think that Huxley only intended to hold Bonnet responsible for a definition, himself alone responsible for the conclusion supposed to be involved in it.

PRIMARY HYPOTHESES OF BONNET'S THEORY.

We might appeal at once to Bonnet's definitions of germs; but it will be better, I think, to consider first the general principles and bearings of the theory as a whole, reserving the definitions to be examined in the light of the ideas underlying them. Let us see what were the primary hypotheses of Bonnet's system of philosophy. Huxley has already pointed out the distinction to be kept in mind between *emboîtement* and *preformation.* These two hypotheses do not stand alone, however; neither are they of equal importance. Preformation, as I have already said, was the central idea—the very heart of the whole system of hypotheses—just that part, in fact, on the maintenance of which hung the life and use of all the other parts, and which was, therefore, most carefully guarded. Other parts could be modified, supplemented, or even wholly abandoned, if need be; but whatever the changes adopted, they were always measured to the necessity of keeping the preformation idea inviolate.

The doctrine of *emboîtement*, although regarded by Bonnet as "one of the greatest triumphs of the mind over the senses," and although filling a very conspicuous place in his speculation, was yet only an auxiliary hypothesis, to be used or laid aside at convenience. Its prominence, as a butt of ridicule, has thrown its companion hypothesis quite into oblivion. I refer to the hypothesis of "the *dissemination of germs*," which Bonnet always held in reserve for emergencies not provided for in "*emboîtement.*" This hypothesis underlies no inconsiderable part of Bonnet's philosophy, and figures prominently in his ideas of regeneration and propagation by buds and slips. The more important modifications of views on the germ are connected with this same hypothesis.

We have, therefore, to recognise three primary parts in Bonnet's theory, namely, *preformation* (of the adult organism with all its essential parts), *emboîtement* and *dissemination*, and to bear in mind that the first stood as principal, the second and third as ancillaries. The latter, as employed by Bonnet, had no use or meaning, except to affirm and sustain the former. Holding firmly to *emboîtement* and dissemination and abandoning preformation would be a monstrous self-stultification. To this it may be replied that no one has charged Bonnet with complete abandonment of the idea of preformation, but only with a modification of his definition of the germ. But a modification that reduced "evolution" to a point where it could no longer be distinguished from "epigenesis" (if the old epigenesis is meant), would seem to fall but a little short of complete surrender.

PREFORMATION.

The whole question turns on what preformation meant to Bonnet. Preformation may stand for ideas that are quite distinct, or even antagonistic. As understood generally by the evolutionists of the eighteenth century, it was *the negation of all new formation.* It was the dogma of *original creation*, according to which all real formation was completed at the beginning of the world. The creative power was believed to have acted once for all, and to have since taken "Ferien," as Burdach (p. 562) expresses it. This was *syngenesis* versus *epigenesis*, *original* formation of all at one time in op-

position to *new* formation all the time. This conception of preformation, which characterised the old evolution, has lost all scientific standing. So far the triumph of epigenesis has been complete, as all admit.

But the word preformation still has its use in an entirely different sense. We speak of the germ as the preformed foundation of the organism to which it gives rise, meaning, not that the adult form is already outlined in all its parts, but that the initial stage alone exists prior to, and different from, the stages that are to follow. In this sense preformation stands in no contradiction with postformation or epigenesis, for both are complementary phases of one development. Development begins with a minimum of preformation and increases this by every increment of postformation, until both the *pre* and the *post* are abrogated in complete formation.

The further we examine the new idea of preformation, the clearer it becomes that it differs *toto coelo* from the old notion. It does not allow that even the minimum of preformation with which development begins was an original creation. The germ is a preformation and at the same time a new formation. Germs are continually forming as the result of growth and self-division. The new germs are the pre-existing germs enlarged and divided. How the original ancestral germs arose we do not know. We find no evidence of spontaneous generation, but it does not accord with what we know to suppose that they were originally just what they are today. As all later stages of development are variable, we see no reason for supposing the initial stages invariable. In fact, germs must have varied, or the evolution of organisms is a myth. But the simplest germs we know grow and multiply by self-division. They do not arise agenetically like crystals, and we do not see how germs could be so simplified as to arise by chemico-physical combinations. The simplest term of the developmental series presupposes the coexistence of the fundamental powers of growth and self-division as absolutely indispensable conditions of heredity and variation. Yet we do not fall back on the rejected hypothesis of original creation. If there ever was a time when no organic elements of the nature of germs existed,—and of this we are by no means sure,—then we feel

warranted in assuming that they came into existence at a stage in the evolution of the cosmos when conditions were somewhat different from those now obtaining, and that they came by the same great highway by which all things come and go—the highway of natural law.

Observe how complete the revolution in ideas. The old preformation affirmed syngenesis and denied epigenesis; the new preformation affirms epigenesis and denies syngenesis. I do not assert that the present idea of preformation affirms all the extravagances that have usurped the name epigenesis; but I do claim that, as now generally understood, it denies the very thing it formerly stood for, syngenesis, and presupposes and advocates the very thing it formerly opposed, generation in the sense of epigenesis. Not only is postformation, which is all there is left of the old epigenesis, maintained, but it is claimed to take place both from within and without.

More than that, everything that preformation now stands for is regarded as the product of phyletic generation—as the heritage of all past epigenesis.

Is it strange that preformation now rests on the very principles it was originally supposed to exclude? No stranger certainly than that the old evolution should die as an idea and live as a name for the antithetical idea of epigenesis. Such changes are not rare, and when comparing the doctrines of development in the eighteenth century with those of to-day, we have to be on guard against concluding from identity of names to identity of ideas. If names could be relied upon for the identification of ideas, it would be easy to make Bonnet the father of the dominant ideas of modern evolution. Bonnet held to continuity in the scale of life, but how different is continuity in *grades* from continuity in *generation* of organisms? Bonnet uses the expression "*genealogical tree*" to describe a branching community of polyps. But would any one accuse modern phylogenists, who make use of the same expression, of reverting to Bonnet's conception, into which the idea of genetic affinity did not and could not enter? The expression "cellular tissue" also occurs in Bonnet's writings, but I have never heard it intimated that Schleiden and Schwann were thus forestalled. If further illustrations

were needed to show that community of vocabulary does not always imply community of ideas, an appropriate one is found in Kant's definition of epigenesis as "*generic preformation*,"[1] and another in Burdach's "*epigenetic preformation*."[2]

BONNET'S POSITION.

Having seen that preformation may stand for extremes as wide apart as the doctrine of specific creation and that of modern evolution, we will try to ascertain Bonnet's position. That he began with the first extreme is undisputed; that he could have held both extremes at the same time is impossible; that he must have abandoned the first if he ever reached, or approximated, the second, is self-evident.

We are generally told that the germ, as first defined by Bonnet, was supposed to be an exact image, or, to use Huxley's words, "*an actual miniature of the organism.*" Although Bonnet's language sometimes appears, at first sight, to indicate such likeness of form, it is made clear from numerous statements that it cannot bear that interpretation. In fact, exact form-resemblance was positively denied. In those earlier meditations upon germs, recorded in the first eight chapters of the *Corps organisés*, we find already the suggestion that the germ state differs from the developed state, approaching the form and nature of a liquid globule (Chap. IV, Art. 57). In Chapter IX of the same work, but written about twelve years later (1759), Bonnet points with evident pride to the fact that he has nothing to change in his earlier views, and again dwells on the contrasts between the earlier and the later stages in respect to form and consistency (Arts. 143, 146, 154), cautioning the reader, however, against supposing that the germ ever represents a fluid in the strict sense of the word:

---

[1] Since the power of reproduction is given in the organisation of the race, it may be said that in the first parents all future generations pre-existed dynamically.

[2] Differing from syngenetic preformation in not being *original*. Called "epigenetic" to indicate that the germs arise in the parent organism, at *different times*, but always *before* sexual concurrence. In the old theories of generation *prae* and *post* generally related to the prime act of reproduction. Preformation was always *complete*; postformation *gradual*.

"On se tromperait si l'on pensait que le germe est originairement un véritable fluide. Les fluides ne sont pas organisés ; le germe l'est, et l'a été dès le commencement. Lorsqu'il s'offre à nous sous l'apparence trompeuse d'un fluide, il a des vaisseaux, et ces vaisseaux s'acquittent de leurs fonctions essentielles. Ils sont donc solides ; mais leur délicatesse extrême paraît les rapprocher de la fluidité" (Art. 154).

In the last chapter of the work, which deals with the formation of monsters, Bonnet says that the germ of the chick differs from the fœtus so greatly in form, proportions, and arrangement of parts that, if we could see it enlarged just as it is, we should not be able to recognise it as a chick :

"Tandis que le poulet est encore dans l'état de germe, toutes ses parties ont des formes, des proportions, des situations qui diffèrent extrêmement de celles que l'évolution leur fera revêtir. Cela va au point, que si nous pouvions voir ce germe en grand, tel qu'il est en petit, il nous serait impossible de la reconnaître pour un poulet. On n'a pour s'en convaincre, qu'à relire l'Art. 146. Le poulet étendu alors en ligne droite, ne présente, comme le ver spermatique, qu'une grosse tête et une queue effilée, qui renferme les ébauches du tronc et des extrémités. . . . Enfin, toutes les parties du germe ne se développent pas à la fois et uniformément." (Part II, Chap. VIII, Art. 351, p. 508. Tableau prefixed to *Palingénésie*, Art. 15, pp. 67, 68.)

It is thus made quite certain that Bonnet did not regard the germ as a photographic image of the adult form, and that idea must be put entirely aside if we would see just what is strictly essential in his conception of preformation.

The essential thing, as we shall see, was the pre-existence of the organism with all its parts completely formed, though not definitively shaped. Development could not form anything new, but it could modify shape and proportions very considerably. The ears, for example, in the germ of the horse were supposed to pre-exist as actual ears, but in what shape and proportions Bonnet never undertook to say. *All his theory required was that they should be present as perfect original creations, admitting of no differentiation or modification in their essential nature.* They must have shape, but not the particular shape presented in the adult state. The Creator had so designed them that, under normal conditions of development, they would expand into the form peculiar to the species. Slight variations of those conditions in the first stages might enlarge these organs to

the dimensions exhibited in the mule, or transform them to monstrous shapes, or even prevent their unfolding at all.

In organs conceived as infinitesimal "organic points," shape, size, proportions, signified nothing. Pre-existence of everything truly organic was the all-essential thing. Pre-existence, precluding all generation and regeneration, reducing all metamorphosis to simple change of external form, leaving no place for growth, differentiation, heredity, variation, or multiplication of individuals or species,—that was the preformation contended for by Bonnet. To be sure, Bonnet had much to say about fertilisation, assimilation, growth, heredity, and other general phenomena of development; but every one of these things was treated as extra-organic, and as purely mechanical means for expanding, without increasing, the original organic framework. All these things appear to go on; but our senses deceive us. They cannot go on at all, according to Bonnet. A mask of falsehood obscures the whole face of nature. Development is a complete illusion; for what appears to arise only emerges from a state of invisibility to one of visibility. Bonnet says:

"It is not necessary to suppose that the germ has all the features which characterise the mother as an individual. The germ bears the original imprint of the species, and not that of the individuality. It is on a small scale a man, a horse, a bull, etc., but it is not a certain man, a certain horse, a certain bull, etc. *All germs are contemporaneous in the system of evolution, they do not communicate to one another their features, their distinctive characters.* I do not say that all those of the same species are exactly alike. I see nothing identical in nature; and without recourse to the principles of *indiscernibles*, it is very clear that all germs of the same species do not come to develop in the same womb, at the same time, in the same place, in the same climate, in a word, under the same conditions. Such are many of the causes of variation." (*Corps organ.* II, Chap. VII, Art. 338, pp. 462, 463.)

But none of these causes of "variation" strike deep enough to change the essential foundation of the organism. Variations disguise the organism, without effecting any real change in its essential parts.

"The soil, cultivation and other special conditions, may influence the proportions and certain characters, so as to make it difficult to recognise the species. Here will be a dwarf, there a giant. Do not allow yourself to be imposed upon thereby;

bring them both to close examination, and you will be able to discover the species in the midst of these deceptive appearances. The forms may likewise change, and disguise the species still more; redouble your attention, and you will recognise the disguise." (*Contemplation*, I, Part VII, Chap. XII, p. 295.)

We meet with this idea of the immutability of species at every turn, in both the earlier and later writings of Bonnet. In the eighth chapter of the *Corps organisés* (p. 90) we read:

"Nature is assuredly admirable in the conservation of individuals; but she is especially so in the conservation of species. . . . No change, no alteration, perfect identity. Species maintain themselves victoriously over the elements, over time, over death, and the term of their duration is unknown."

In the same chapter (p. 89) Bonnet says:

"We cannot doubt that the species which existed at the beginning of the world, were no less numerous than those which exist to-day. The diversity and the multitude of combinations, perhaps also the diversity of climates and of foods, have given rise to new species or to intermediate individuals. These individuals uniting in their turn, the shades have multiplied, and in multiplying become less noticeable. The pear-tree among plants, the common fowl among birds, the dog among quadrupeds furnish striking examples of this truth."

Here Bonnet speaks in language befitting modern evolution of "new species," the very thing so positively denied. This manner of self-contradiction is habitual, and there is not the least inconsistency in it. Bonnet describes *appearances*, and he expects the reader to remember, what he has so often repeated, that appearances are deceptive. In many instances he uses the language of modern evolutionary doctrines without having any conception of them, and carrying always ideas that contradict them.

BONNET'S PREFORMATION AN INCORRIGIBLE NEGATION.

This preformation theory, contradicting appearances at every point, seemed to Bonnet and many other eminent men of the eighteenth century to magnify the glory of the Creator. To us it seems to be scepticism towards all nature, crystallised into a colossal system of inflexible negations, each involving the others, and all involved in one capital negation: No ESSENTIAL CHANGE IN THE ORGANIC UNIVERSE.

The discovery of a single flaw in this all-embracing negative would put the whole theory in the light of a "romance," as Bonnet himself repeatedly declared. In one of the last of the many supplementary notes to the final revision of the *Corps organisés* (1779), Bonnet reaffirms this negative as a fundamental principle to which he had always firmly adhered. The note begins with the following warning from Haller:

"Observe that it is very dangerous to concede the formation of a finger by accident. If a finger may thus form itself, then a hand, an arm, a man, will do the same."

To this Bonnet replied:

"You are right; I have insisted upon that point a hundred times. I came to that conclusion long before you, when you supposed it possible for *une glu se figer et s'organiser*, and when epigenesis pleased you most. (*Corps org.*, Art. 155.) But observe, in your turn, that I have never attributed the *formation* of the least thing to *accident*. I have always conceded and maintained the preformation of everything that is truly *organic*. M. de Mairan made the same remark to me as yourself, and he received the same response. His objections against the sixth finger relate only to the graft of Lemery. I have not appealed to ingraftment; I have merely questioned if accidental causes might not have separated one or more fingers while they were yet in a gelatinous or nearly fluid state. In a word,—*and can I repeat it too often?*—I have never conceded anything but simple modifications of preformed parts, except certain cases of grafts or accidental separations." (*Corps org.*, p. 543.)

Such was Bonnet's testimony in 1778, while engaged in the final revision of his works, over thirty years after putting his first meditations on generation into manuscript (1747), and about ten years after concluding his system of philosophy in the first edition of the *Palingénésie philosophique* (1769). It was his testimony after a prolonged consideration of that greatest of stumbling-blocks to the evolutionist, the *propagation of monsters*. Although finally forced to admit that sex-digitism could be transmitted by either sex (p. 536), Bonnet maintained his position as firmly as ever, only hesitating to pronounce decisively between the hypothesis of originally monstrous germs and that of accidental causes. On this point he could close his volume with, "*fiat lux*," but on the main thesis,—*all preformation, no generation*,—he had chained himself irrevocably, and left himself no possible escape.

The same incorrigible negation meets us in Haller's dictum: "*Nulla adeo est epigenesis.*" To Bonnet it remained to the end the alpha and omega of philosophy and the sheet-anchor of religious faith. Let one example suffice:

"A true philosopher would not undertake to explain mechanically the formation of a head, an arm, however simple might be the structure of this head or this arm. In the most simple organic structure there are still so many relations; these relations are so varied, so direct; all the parts are so intimately connected, so dependent on one another, so co-operative to the same end, that they could not be conceived of as having been formed one after the other and arranged successively, like the molecules of a salt or a crystal. A sound philosophy has eyes that discover in every organised body the ineffaceable imprint of a work done at a single stroke, and which is the expression of that Adorable Will that said, '*Let organic bodies be, and they were.*' They were from the beginning, and their first appearance is what we very improperly call *generation*, *birth*." (*Contemplation*, Part IX, Chap. I, p. 2.)

After wrestling with all the perplexing questions presented in Hydra; after accounting for sex as a means of diversifying the unity of the *beau physique*, and sexual reproduction as a device for expanding the germ and preserving regularity of specific form; after reconciling the existence of varieties with the permanence of species; after contending that a mule is a disguised horse and a hinny a disguised ass, and that the sterility of hybrids is to be regarded as fertility kept dormant by lack of adequate means to unfold; after reducing all heredity to likeness of original, contemporaneous, and independent creations, unfolding under similar conditions; after elaborating a scheme of "natural evolution" broad enough to take in any number of cosmic revolutions, and provide for the ultimate perfection of every organism as an immortal being;—in a word, after setting "Ferien" to all creative activity, Bonnet resolutely undertook to devise a scheme that would keep the holiday repose forever inviolable. With a zeal never daunted, and an ingenuity seldom baffled, never defeated, he piled mountain upon mountain of negation, rolling Ossa on Olympus and Pelion upon Ossa, until the whole organic world seemed to be completely buried under a stupendous mass of negations, blending in one infinite negation—No Change.

University of Chicago. C. O. Whitman.

LITERARY CORRESPONDENCE.

FRANCE.

WE BEGIN, to-day, with four works treating, from different points of view, of substantially the same question, that of plurality and unity, of phenomenism and monism, around which the "theory of knowledge" incessantly revolves.

M. De Roberty, in his work, *Auguste Comte et Herbert Spencer, nouvelle contribution à l'histoire des idées philosophiques au XIX. siècle*, studies, in the form of a criticism of the systems of these two philosophers, what he calls: "The conflict of two great cerebral waves, which flow in opposite directions: monism and agnosticism." In vain, he says, has the spirit of synthesis sought to force them into one bed. The undertaking was illusory, and we have seen, ever since Kant, the philosophers wandering afield in efforts to "combine the quest for unity with the dualism of knowledge." Their efforts after universal synthesis have turned back upon their agnosticism, formal or latent, whichever it was.

The criticisms of M. De Roberty are exceedingly interesting, although at times difficult and abrupt. Auguste Comte, he well shows, sought after the idea of unity not less than did Spencer; and we must accept as equivalent the idea of evolution adopted by the latter and the idea of a necessary and gradual development amplified by the former. Yes, the Comtian hierarchy of the sciences and the so-called law of the three stages does involve the idea of evolution, as I have observed more than once myself. But what is to be seen in evolutionism if not the affirmation of the experience which implies, under the forms of differentiation and integration,

"the two sole modes by which the mind seizes now the multiplicity of things and now their unity?"

We shall always, writes M. De Roberty, apprehend things or their *notions*, their *ideas*, by the aid of two opposed concepts. But that procedure, natural as it may appear, is after all nothing but a procedure, a method, a means. "It cannot set itself up as a definitive result, a final conclusion, an end in itself." Agnosticism, he continues, has never been willing to comprehend that simple truth. It appeals to the principle of the relativity of knowledge. But it is imperative that we should have some understanding of the true meaning of the principle of relativity. Its foundation is the *identity of contraries*, and relativism presents itself in the final result "as the psychological aspect of the principle of universal unity."

Comtian or Spencerian monism, with agnosticism and evolutionism, according to M. De Roberty, is the third of the great dogmas to which the universal conceptions of the past, be they theological or metaphysical, can be successively reduced. Comte wished to obviate the faults of doctrinal pluralism (he went so far, we will remember, as to declare the fundamental facts of the abstract sciences irreducible) by proclaiming the preponderance of the social or moral element, in doing which he reverted to the old teleological anthropomorphism. Spencer, in his turn, arrived at a reconciliation of the simple and the manifold only by means of a verbalism that masked the purely conceptual nature of the laws invoked by him as representing the facts. Confounding, instead of combining, the points of view of the different sciences, he succeeded at best in merely "flashing before our eyes, in the face of the purely logical unity of facts, the phantom of their unity, called real or transcendent." Let us note this last trait well. There lies the profound word of this criticism.

* * *

M. E. Boirac, in his *L'idée du phénoméne*, a clear and well-sustained work, skirts closely the thesis of M. De Roberty. He, too, battles against the noumenon of Kant and the unknowable of Spencer. Phenomenism and idealism—those two aspects have seduced the human mind, each in its turn! Now, what happens! When

the philosopher, if I may be allowed the metaphor, proclaims phenomenism, the reduction of substance and being to pure phenomenal modalities, a malicious genius places before his eyes a mirror which sends back to him his own image; and when he proclaims idealism, the reduction of phenomena to thought, the same genius in place of the mirror holds before him a transparent glass, through which he sees the world depicted. In the two cases he is aware of the inherent contradiction of his artificial monism, and seeks his refuge in subsidiary conceptions, in compromises with the dualism of sensible experience.

M. Boirac has rehabilitated, as he himself confesses, the substantialism of Leibnitz, with amendments. For him the phenomenon is not all. Objective knowledge and phenomenon are synonymous. The duality, the opposition of seeming and being, of matter and mind, is not necessary. "The phenomenon and the substance are inseparable from one another, as they are two complementary correlative aspects under which all existence appears both to us and to itself." Substance exists, therefore, but it is naught else than the thought itself of the relation which binds the phenomena together, the real and living idea, the intuition of their solidarity, of their inner continuity.

It would seem as if M. Boirac had, by a dialectics of his own, arrived at the logical monism of M. De Roberty. Nevertheless, the obstacle which he finds in the multiplicity of the *partial* thoughts reveals in him a distinct type of mind. How are we to reconcile that multiplicity, he asks, with the unity of the universal subject, with the *total* thought? That problem, which appears to him formidable, indicates perhaps the disquietude of a transcendent substantial monism, which may soon lead him to give a new shape to the difficulties which he has sought to solve.

* * *

In his *Définition de la philosophie* M. ERNEST NAVILLE affirms once more his spiritualistic faith. To him spiritualism is the only monism reconcilable with the distinction between the elements of the universe established by philosophical analysis, the only one which resolves the problem of the coexistence of the simple and the mul-

tiplex, and of the finite and infinite. The free-will of man, the postulate of the moral order, has only place, he repeats, in a doctrine which makes of liberty the principle of the world. The distinguished and venerable professor also demands that "the practical consequences of systems of philosophy should be one of the essential elements of their valuation." But how are we to determine, in advance, the practical consequences of a system? Where are we to get the criterion to judge them by? If we went to the bottom of the question, we should soon come again upon all the difficulties which it clears up.

Affiliated with the philosophy of M. Naville is that tendered to us under the title of *Science et conscience, ou théorie de la force progressive*, by M. KLEFFLER, an engineer who died recently. The "philosophy of common sense" M. Kleffler calls it, considering the affirmations of spiritualism as the data of common sense; or "the natural method," for it appears to him inconceivable that philosophy should not assume the task of reconciling the objective data analysed by science with the subjective data furnished by consciousness. I see pretty clearly where our author, who is a mystic without knowing it, would lead us. But how difficult the road is! What abuse of dialectics, what absurd obscurity! Common sense, of whom? That of M. Kleffler or that of M. De Roberty? That of the eleventh or that of the twenty-first century? Common sense is not something primitive, it is something resultant. How are we to prove that the common sense or consciousness of one class of individuals, or of one historical epoch, expresses the necessary, universal mentality? There is nothing universal and necessary except our logical actions which have worked to produce the qualified mental states of the "common sense." But those products themselves are changeable and modifiable in a large measure. The mill-stone of our mill serves for grinding grain of all sorts; according to the grain which we give it, will be the flour it grinds for us.

* * *

We come now to a few books on psychology. The first is the *Introduction à la psychologie experimentale* of the Messrs. A. BINET, PHILIPPE, COURTIER, and V. HENRI. The second is also a work

by M. BINET entitled *Psychologie des grands calculateurs et joueurs d'echecs.*[1] I need not speak of them here as both were reviewed in the October *Monist*, of last year.

I shall not pass so rapidly over the little volume of M. GASTON DANVILLE, *La psychologie de l'amour*. It might have been better composed and livelier in style. But it has its value, and we must accede to M. Danville the merit of having searched for and perhaps found a "psychological" definition of love, that is to say, of the affective and intellectual state which accompanies the sexual appetite in the higher animal—in man. His formula is a little complicated, and I hesitate to transcribe it. It will suffice to indicate its sense, to give the analysis which has led him to it. That analysis, running along the scale of the animal species, shows an evolution which has made love pass from its *motor* phase to its *affective* phase and from thence to the *intellectual* phase. In the motor stage the appetite engenders only movements, in the affective stage it is manifested along with a cortège of characteristic emotions. The intellectual period, finally, which is only realised in the heroes of love, reveals by the choice of the object loved and the consciousness of the goal pursued, a more complete systematisation in actual sight of an *ideal* preformed and recognised. Max Nordau had previously signalised the prominent rôle of the ideal in love. But M. Danville had not read the *Paradoxes* of that author, and I regret also that he has not spoken of the *Psychologie der Liebe* of Julius Duboc, if, peradventure, he knows of it. The work of that philosopher, which I have discussed in France,[2] merited mention in M. Danville's book.

Still the psychological side of love should not cause us to neglect too much the physiological side. Without the sexual appetite the whole psychical tableau would be effaced. Love remains essentially an appetite, like hunger and thirst. The accoutrements alone change. The delicate, high-strung lover resembles in some respects a connoisseur of wines who embellishes the gross needs of the table by eating and drinking upon fine linen, in flowered porce-

---

[1] Published by Hachette ; the other works mentioned are published by Alcan.

[2] *Un athée idéaliste*, in the *Revue philosophique*, Nov., 1884.

lains, and from polished crystals. Yet eat and be nourished he must; ultimately, it is the same affair.

This M. Danville does not gainsay. Where he seems to me to carry things too far is when he refuses to see a pathological symptom in that "excessive" obsession, which leads the lover to absurd or criminal acts. True, I do not wish to say that a man is insane for loving passionately. But the criterion of "utility" invoked by M. Danville for the justification of the Werthers is insufficient; it leaves us a deficit in the analysis of the facts. Amorous obsession, he tells us, is useful because it makes for procreation. But that end could have been just as well attained with another woman. And it is recognised by poets and physicians of love that one *can* truly love more than once. Besides, the end is totally lost when suicide is committed or when one does not recover. The criterion ought to be sought rather in the power of inhibition. It is not so much aberrancy of mind that causes the morbid obsession, as impotence in getting away from it and escaping from its anguish. If this power is null or very weak in individuals, it is imperative to look upon such at least as neurasthenic subjects. The writers of to-day will have much on their hands. They will not make us accept as normal and virile individuals, the heroes of their passionate dramas. The Werthers burn out their brains, or worse still; the Goethes survive. After a certain stage the lover becomes the dupe of his imagination, and to his great detriment the equilibrium is destroyed in him, between the angel and the brute. Supposing him to have a more vigorous temperament, and a richer affective equipment, he will resist and he will love again. The incapacity for a new ideal marks only the exhaustion of the nerves and the impoverishment of the sentimental life, far from signifying force and superb expansion.

* * *

We have now to speak of a book, which in my judgment is a remarkable one, *Le sentiment et la pensée et leurs principaux aspects physiologiques* by M. André Godfernaux. I have read this book with all the more sympathy as M. Godfernaux has drawn his inspiration from M. Ribot's instructive oral courses, and from the clinical lectures of my master and friend, Dr. Magnan. The task he

has set himself is to seek out the relations which exist between sentiment and thought, that is to say, between the phenomena of the affective life, of internal origin, and the phenomena of representative life, of external origin. The various forms of mental alienation have supplied him with so many striking examples of these relations, the affective state has appeared to him, in psychosis and chronic delirium, so visibly the agent which influences the systematisation of thoughts, that far from the intellectual troubles having their origin in the thought itself he has been led to conclude, that in the normal consciousness, sentiment and thought should be in equilibrium, and that the one should grow as the other diminishes. In fact, in this respect normal psychology repeats morbid psychology, and this important consequence then imposes itself upon us that "the affective state is, even in a healthy individual, the ultimate agent in the association of ideas." Beyond question, ideas and systems of ideas cannot be welded together mechanically. The individual activity of the subject must intervene. And it is incumbent upon us to ascertain what that activity in its ultimate roots is.

I am favorably disposed to this theory, for I have touched upon it myself in a work just published and having for its title *Mémoire et imagination.* I, too, insist in this work on the motor elements which "double the systems of perceptions" that I there study, and I point out, for example, the ideo-motor nature of the professional memory of the painter, the musician, and the orator.

M. Godfernaux also emphasises what he calls the "motor-equivalent" of the affective state. The basis of our inner life, according to him, is made up of *tendencies* (Ribot's theory). Now, these tendencies, acquired or transmitted, especially the latter, are, he says, the underlying "dynamic associations" to which our *emotions* correspond. When the tendency, seeking to satisfy itself, systematises definite muscular elements, the emotion produces a synthesis of definite elements of consciousness, that is, of associations of ideas. The parallelism, in fine, is constant and rigorous between the conscious and the motor life. "The phenomena of consciousness act and react upon one another, and combine with one another

like the motor phenomena to which they correspond." This formula epitomises the whole work.

I am sorry that I cannot dwell at length upon this study. I shall point out, in closing, simply its "philosophical" conclusion. M. Godfernaux accepts a dualism of matter and mind, which, in my judgment, signifies nothing more than the collaboration in the human individual of heredity and personal initiative. A law which binds together body and mind, he says, asserts that body and mind tend alike to adapt themselves to their environment. What is here biological function is there logic and reason. But what is the essence of the adaptation? What is the true personal capital of the individual in the vast aggregate of the inherited influence of his species? That question still remains open.

* * *

Four important works on sociology next claim our attention. Let us see if we can make clear to ourselves their spirit and scope.

First, M. G. TARDE gives us his *Logique sociale*, a large volume of nearly five hundred pages and constituting the sequel to his *Lois de l'imitation*, of which I have spoken before. This work, like all the books of M. Tarde, is conspicuous for the wealth of its ideas, and the originality of its point of view. I should say even that the profuseness of details in this instance hinders a clear comprehension of the whole. The author aims at a reconstruction of sociology. What is his idea here? Auguste Comte, and after him Herbert Spencer, links sociology with biology. M. Tarde is more particularly concerned with psychology. The two first-mentioned philosophers likened societies to organisms; the latter prefers to compare them to that anomalous and privileged organ, the brain. Such are the premises from which all the rest follows.

First, an observation. Undoubtedly, Comte in the classification of the sciences rested sociology on biology. But it is to be remembered that in his view psychology is merely a branch of biology, and it is absolutely impossible to contest that he connected the development of society with a confessedly psychological principle. According to Comte, ideas "rule the world," and his celebrated "law of the three stages," which is also a law of evolution, makes

the progress of society depend on a purely intellectual element. Comte did not, therefore, in the rigorous manner that Spencer did, liken societies to brainless organisms, and M. Tarde might claim him as his predecessor. However, let us see to what results this comparison of society with the cerebral organ leads us. The novelty of the point of view will be evident.

Comte had confined himself to deducing from a general study of history his law of succession of the theological, metaphysical, and scientific stages; he explained history by the internal action of the methods that had produced and sustained those truly characteristic epochs of human thought. Littré has since shown—I may be permitted here to remind the reader of it—that whilst the law of the three stages is still properly applicable to *intellectual* development, it no longer suits well with the development of *economical* and *artistic* facts. Without discussing at present the merits and the defects of that formula of Comte, let us observe that this philosopher gave his law as a complete whole, and that he did not go back to the psychological study of man, who is the real factor of history. Now it is just here that M. Tarde, basing his views on the numerous results recently reached in psychology, has made his innovations and additions.

In the first place, he advances the extremely apt reflexion that that which has been actually and historically realised is a part only of what could or might have been realised. Determinism admits of *possibilities*. There can be no doubt, I think, that biological developments *could* have taken place that have nevertheless been arrested. Human history also presents us with lines of growth which have been cut short or have been unequally developed. It will be sufficient to mention that phenomenon in Chinese history which has reached such interesting organisation and is founded on the perpetuity of family and the inalienable family property.[1] Starting from this idea of possibilities, M. Tarde has had to forego the consideration of evolution in an undeviating straight line. He has not sought,

[1] I shall have something to say later concerning the studies of M. Eugène Simon, *La cité chinoise*, *Sur la terre et par la terre*, *Le familiat*, etc.

he tells us, to disengage the historical succession of events from its actual concatenation with inventions and discoveries; he has only sought to point out the *ensemble* of their possible concatenation. The allusions to "inventions" here is in its broadest sense. Imitation, it appears to him, plays socially the psychological rôle of memory; invention, he regards as the social equivalent of perception and decision, of judgment and will. In short, sociology as he understands it, is merely a magnified psychology—a *collective* psychology.

The reader must go to the work itself for the exposition of this psychology. M. Tarde will explain to him "how the social tissues are formed" and "in what manner they are organised." He has done this with rare talent. But does this collective psychology constitute all of sociology? Will the analysis of these two factors, imitation and invention, dispense us from studying the social structure in itself, in some such way as we study the organisation of the biological series? Is the search for a general expression of the results of human activity forbidden us, and will the abstract characterisation of such an expression, the law of Comte, for example, shut out forever the reality of the facts which it sums up and defines? In speaking of the "social tissues," M. Tarde, perhaps, is not so far removed as he thinks from that comparison of societies with living organisms which we shall now see another author take up and define with greater precision.

* * *

M. le Dr. Julien Pioger, in his new work, *La vie sociale, la morale et le progrès*, still persists in basing sociology on biology. He admits, with Greef, that we find in the social life different functions from those of organic life; but maintains, nevertheless, that the justest conception which we can form of the social functions is to regard them "as manifestations of the social organisation in every respect analogous to what are called functions in biology." The knowledge of the individual does not exhaust the knowledge of the social datum. The moment he is taken into the collective organism the individual is no longer a discrete being. The conditions of his activity are then modified, as are also the effects of his acts. "Without the social structure, without its support, or bond, the individual

lives would succeed and come into juxtaposition with one another without presenting that unity, that continuity in time and space, which gives to each society its individuality and life."

But to what part of the organism are we to assign the individual? Man, answers M. Pioger, corresponds better to the blood globule than to the anatomical element properly so called. "Blood globules represent the living element *par excellence*; they circulate in all the tissues, etc." He adds: "Just as the grand biological functions, alimentation, respiration, circulation, and innervation are not discharged by the anatomical elements individually, but result from their differentiation, from their appropriation, from their specification, by organisation into physiological apparatus to which the blood supplies activity, similarly, the social functions are not the work of man individually, but result from the differentiations, adaptations and organisations of social elements into organs to which man transmits his activity."

That imitation, therefore, for which M. Tarde seeks his laws, is fundamentally conditioned by the social fact itself. Without reaction upon the individual no imitation; no reaction if the individual is not already united by bonds of solidarity with his fellows. Accordingly, we must always seek the point of a departure in the plasticity of a human being (imitation, evolution, selection, heredity, or instinct), the point of arrival in his social incorporation, in his "socialisation."

"It is not," writes M. Pioger, "because societies do not constitute living organisms that they resemble those organism so little, but because at present they are only in a lower stage of their development and because if we wished to compare them at all to living organisms we should do so not with the higher animals but with the lower organisms called polyzoans, in which physiological individualisation is still imperfect."

M. Pioger has many excellent pages on "progress." They flow from his leading conception and also show its advantages. I should only have to place some reservations on certain conclusions of his in the economical field, which I do not think are well founded.

M. G. Le Bon in his *Lois psychologiques de l'évolution des peuples*, like M. Tarde, explains the phenomena of history by a species of collective psychology. He is not occupied with seeking out the secrets of events in the play of a "social logic"; but he regards the races as "individuals" and centres the life of history in the life of those races. He studies their psychological characters, their formation, the limits of their variability; he shows how the psychological characters of races manifest themselves in the different elements of their civilisation, how they modify each other, and finally, how they are dissociated. Races—historical races or nations—possess in the opinion of M. Le Bon characteristics of varying and very unequal worth, but stable. "Every nation," he writes, "possesses a mental constitution as fixed as its anatomical characters, from which its sentiments, thoughts, institutions, beliefs, and arts are derived." He maintains that "grand, permanent laws control the general march of each civilisation"; but among those permanent laws "the most general, and least reducible," appear to him to flow "from the mental constitution of the races." Let not the reader think, though, that M. Le Bon is seeking for a law of history in intellectual evolution, after the manner of Comte! Emphasising the importance of "ideas" as he does, yet when he studies the causes of the decadence of nations he discovers those causes in the degeneration of "character," and even slights the import of intelligence in the success of nations. He excellently remarks that ideas have no efficacy until they have passed into the feeling. Still, some confusion subsists; for ideas are not equivalent to inventions. Either intelligence does not represent for M. Le Bon all that the word implies, or character signifies more than is implied in it. Hence arises a hesitation—one might say, a contradiction—in the thought of the author, and this is partly the reason that his work, although full of just *aperçus* (I discover in many passages the influence of Madame Clémence Royer, and above all of M. Charles Mismer) is not entirely satisfactory. The reading of the book is instructive and interesting, but one is not convinced nor moved by it.

One word more. The races of M. Le Bon so far as they constitute independent series correspond in a measure with the "possi-

bilities" reserved by M. Tarde, and place before our eyes the concrete varieties of history. But the relative place of the races in the chart of general civilisation is not determined by the characterisation ; an easy comprehension of the whole is still lacking, and those "psychological laws of the evolution of the nations," even if they were less vague, afford us scarcely the least hold on the evolution of humanity.

* * *

His latest book, *Les gaspillages des sociétés modernes*, will assure to M. J. Novicow the place which his previous works have gained for him among the economists of the French language. M. Novicow had shown progress to be involved in the different transformations of *competition* in life, which at the outset was purely biological but passed finally into the domain of ideas. He takes up to-day the study of the conditions which favor the economical progress of society and of the causes that retard or prevent it. The causes of evil are to be understood only from the conditions of the good, and if we define progress with M. Novicow as the adaptation of man to his environment, and of the environment to man, as effected in the least time, and with the least possible effort, we shall be near to conceding with him that the vice of our great social machines is their unbounded waste both of the time and labor of men.

Poverty, he writes, does not come solely from the inequality of the distributions ; it still comes largely from the insufficiency of the goods to be distributed. The socialists complain of the first of these facts, but usually neglect the second. To attain a really adequate state of well being, it will be necessary at least to quintuple the present production. Now three fundamental errors prevent this: the confounding of wealth with money, the confounding of wealth with property, and the belief in a state of original perfection. The author shows, and this is the gist of the book, that the first engenders protectionism, the second social parasitism and the spirit of conquest, the third intolerance and routine.

No doubt M. Novicow will be reproached with not having always sufficiently taken into account the difficulties of adaptation peculiar to each time and each country—a neglect which has led

him at times to rather severe judgments. To this he will reply that he has only wished to sketch out a general preliminary plan to which it will be wise to conform. If other critics reproach him with having simplified the questions too much, they will at least do him the justice of granting that his purpose in simplifying them has been to make them more easily understood. He lays bare our most sensitive wounds; but he cherishes a confidence in the future which stimulates and comforts us.

* * *

With M. Francelon Martin's new work, *La perception extérieure et la science positive*, we return to pure philosophy. M. Martin has order and clearness; but his habits of mind are not ours, and his reasonings have not convinced us. He has undertaken to show: (1) that science has passed through three very clearly marked stages —the substantialistic interpretation (of what things consist), the finalistic interpretation (why they exist), and the mechanistic interpretation (how they have been produced and are conditioned); (2) that science retraces the path of perception, but in the opposite direction: all that perception, or spontaneous, concrete observation has put into things (time, space, causality, finality, substance, individuality,) it is the effort of the scientific mind or abstract observation to get out of them again, by substituting quantitative relations for the qualitative relations which nature presents.

The first thesis is maintainable. I have myself long made use of a similar seriation for my own instruction, but I would not exaggerate its merits. As to the second thesis, the definition of M. Martin slightly perplexes me. If "perception" signifies the simple judgments by means of which in the multiplicity of sensations the mind gets light for arriving at a relatively precise knowledge of particular facts or "individuals," we may say that science has for its end the more exact knowledge of elementary facts or "concretes." If perception denotes merely tentative explanation, we may remark that it corresponds in some measure to the intellectual state designated fetishistic or theological. Take it as we will, then, perception appears to be only a species of imperfect science which in the historical or individual evolution remains the substratum of perfect

science. But I cannot very well see what the value is of the parallelism of M. Martin, from the point of view of a "philosophy of the sciences" and of the explanation of scientific development.

What appears most clearly in this work is the desire to withdraw *mind* from the action of the external world, to restore it as a primordial agent, to battle against the mechanical theories, and to reach the ground of idealism by the path of criticism. "Kant," says the author, "assumes things to be formed by the mind; the empiricists assume the mind to be formed by things; we shall consider it as forming itself by experience." M. Martin desires neither to neglect evolution as Kant did, nor to slight mind in the manner of the empiricists. He does not seek to conceal, I think that he *reserves* mind rather than discovers it. What does the old antithesis accomplish in which both idealism and materialism still loiter if not the objectification and substantialisation of simple logical positions.

* * *

M. Tescanu publishes, with a biographical notice, the *Théorie sur l'ondulation universelle, essai sur l'évolution*, of his Roumanian compatriot, Basile Conta, a philosopher who died very young. The profundity of the work will interest the reader less perhaps than the intellectual character of its author. In some respects M. Conta was the disciple of Büchner. He calls himself a materialist, has cast aside all religious belief and sees in the universe only force and matter. With extensive knowledge, he has hardihood and penetration. But that does not prevent him from being naïvely enough a metaphysician. He thinks anew the science of others and aims to grasp the world in a formula. In his principle of universal undulation, where the evolutionism of Spencer is corrected by the attractionism, or rather gravitation, of Newton, I see a personal effort for a better comprehension of things by means of a hypothesis, I see a procedure of acquisition rather than a well-worked-out theory. M. Conta was a true philosopher, who was unfortunately not permitted to complete his full evolution and to fulfil all his promises.

I shall point out in closing an excellent work by M. Georges Dumas, *Les états intellectuels dans la mélancolie*; a fine study by M.

Fr. Queyrat, *L'abstraction et son rôle dans l'éducation intellectuelle*; a very interesting little book by Georg Hirth, which I have translated into French under the title of *Les localisations cérébrales en psychologie* (*Pourquoi sommes-nous distraits?*); the *Spinoza* of M. Leon Brunschwieg, which seems to me an excellent *résumé*; and finally the *Philosophie de Jacobi* by M. Lévy-Bruhl, an extremely erudite contribution to the history of German thought.

Lucien Arréat.

Paris.

BOOK REVIEWS.

AN INTRODUCTION TO COMPARATIVE PSYCHOLOGY. By *C. Lloyd Morgan*, Principal of University College, Bristol. With Diagrams. London: Walter Scott. New York: Charles Scribner's Sons (imported). Pp. 382. Price, $1.25.

Works of the type and spirit of Prof. C. Lloyd Morgan's *Introduction to Comparative Psychology* are rare. By its ease and vivaciousness of style, its clear singling out of the fundamental points of interest, its economy, its philosophical grasp and broad comprehensiveness, it is an exemplar of what the propædeutics of the subject should be. From a rich life, sustained by exceptional advantages and a rigorous scientific training, Professor Morgan has gathered a wealth of illustration and argument that plays with a never-failing light about his expositions. It is not the least of the merits of the book, and certainly an unfrequent trait in any work, that the author's conclusions, even where they may be allied to the results of others or have been suggested by them, are essentially the outcome of independent thought reached in connexion with independent data. For example, his experiments with newly hatched chicks and ducklings, which in themselves constitute an invaluable psychological document, form almost entirely the empirical basis of his conclusions regarding animal instinct and intelligence, association, animal sense-experience, etc. We have before us the facts that the author had, and are placed by them in immediate touch with reality. The results of Professor Morgan's inquiries are not a little enhanced by this trustworthy mode of procedure.

Two main purposes pervade the work: first, to discuss the relation of the psychology of man to that of the higher animals; and secondly, to consider the place of consciousness in nature, the relation of psychical evolution to physical and biological evolution, in the light which comparative psychology throws on certain philosophical problems. We shall take up the second heading first, premising that the author throughout accepts evolution as the basis of his explanation of nature, including psychical nature, and that his method of interpretation is the monistic method, as that will herein be defined. In the first place, Professor Morgan's monism is resolvable into three aspects: (1) it is a monistic theory of knowledge; (2) a monistic interpretation of nature; and (3) analytic monism. According to the first, object and subject, cosmos and self are of co-ordinate reality; they are the polarised

aspects of experience as explained through reason. This does not exclude but needs as its supplement a further *hypothesis*, which, in so far as it is monistic, declares that nature is explicable; that the organism both in its biological and psychological aspects is a product of evolution; that mind is not extra-natural, nor supra-natural but an *aspect* of natural existence. According to Professor Morgan's form of monistic philosophy, the evolution which sweeps through nature is characterised by three traits: (1) it is selective; (2) it is synthetic; (3) it tends from chaos to cosmos. What this means we shall see later. The third aspect of monism is termed analytic, which declares that the true reality is the man, one and indivisible; that body and mind, object and subject, are products of *analysis*, distinguishable in thought but not separable in existence.

So far, Professor Morgan has trodden the ground of purely experiential analysis. A final step, he thinks, is necessary. That selective synthesis of the cosmos which shows itself in evolution is regarded by him as the manifestation under the conditions of time and space of an underlying activity which is the ultimate cause thereof. This underlying activity is not a product of evolution; it is that in and through which evolution both of body and mind is rendered possible. In this synthesis he seems to find "the essence of the whole process, that which makes it comprehensible or rational"—the divinity that shapes the ends of the world and which there would certainly seem to be no objection to calling God, if we had the least encouragement from the author to add such an appellation. Of this underlying activity, object and subject, as we have stated before, are correlative modes of manifestation inseparably united in experience but fundamentally distinct in aspect. Now, how has this two-faced unity had its origin? This is the problem of psychology.

It would be impossible for us to reproduce the powerful and subtle steps by which we are led up in this book to the conclusions which the author adopts, and in stating here merely the bald results we must say that much of their cogency and argumentative coloring is lost. In the first place, "the Not-self is the generalised "concept of all that reflexion has taught us concerning the objective aspect of the "data of sense-experience; the Self is the generalised concept of all that reflexion "has taught us concerning the subjective aspect of our life experience." How has that consciousness arisen which is the symbol of this Self? What is its significance, and what is its relation to the Not-self?

We seek our point of departure in the study of the correlation of psychical phenomena with physiological phenomena. A living organism, unconscious as a fertilised ovum, passes through the conventional stages of birth, conscious maturity, and death. Here again consciousness is absent. In the ovum nothing approaching to that orderly complexity of molecular vibration which we find in the brain is present, but gradually comes with the development. In this molecular vibration, the manifestation of physical energy more than structure is important. Incidentally, we have a very significant opinion of the author here, namely, that "the problem of

"development will have to be attacked in the direction rather of energy than of struc-"ture." "Life is like a vortex in a rapid stream;—on surrounding energy it is de-"pendent for its continued existence; into surrounding energy it melts away. And "this is true not only of individual life, but of life in its entirety."

Passing, now, to states of consciousness absent in the ovum but gradually becoming present in the matured organism, are we not forced by parity of reasoning to assume that they, too, have been developed from something more simple than consciousness, but of the same order of existence which answers subjectively to the simpler organic energy of the fertilised ovum. In other words, "as the complex "molecular vibrations of the brain are to the simpler molecular vibrations of the "ovum, so are the complex states of consciousness associated with the former to the "simpler states of infra-consciousness, if we may so call them, associated with the "latter. It is the association of consciousness and infra-consciousness with energy "—its objective manifestation—that is the distinguishing feature of the view which "I am endeavoring to set forth." One step remains. "We must say that all "modes of energy of whatever kind, whether organic or inorganic, have their con-"scious or infra-conscious aspect."

Generally three answers are possible to the question, how did consciousness come to exist? The first says, it has been specially created in man or in his ancestors; the second, that it has been directly evolved from energy; and the third, which is Professor Morgan's solution, and has its roots in Spinozistic thought, that it has been evolved from infra-consciousness. Now the first answer, that of special creation, says Professor Morgan, "is in my opinion a logically tenable one, and "one with which I have sincere sympathy. I do not hold it myself, because it does "not seem to me either the highest or the most probable view of the matter; but "if others hold it on these grounds, so let it be. With the second answer I am in "distinct and direct antagonism. I do not think it has a single genuine fact of ob-"servation in its favor."

We have now to consider that *selective synthesis* of evolution of which the animate and inanimate world is the product. Looking over the development of inorganic nature, at crystals when forming, at chemical compounds when combining, and at the interruptions observable in the transitions of bodies through the solid, liquid, and gaseous states, we find in such a survey three distinctive features: "se-"lective synthesis of a definitely determinate nature; the controlling conditions of "the environment; and apparent breaches of continuity in what we may term the "curve of development." Now these teachings of inorganic nature, the psychologists have interpreted in two ways. The Empiricists, laying great stress on the facts of association, do not appear to recognise an underlying law of synthesis but seem to regard consciousness as the mere spectator of a series of physiological changes in nerve-tissue. The Apperceptionists, on the other hand, regard the selective synthesis as the essential and central feature in mental development, contending, however, "that this selective activity, to which they apply the term 'ap-

"perception,' is something *sui generis*, and peculiar to mind, something which is "not found elsewhere in nature." In the reconciliation of these two views lies the gist of Professor Morgan's theory. He denies the last, but affirms the first, conclusions of both Empiricists and Apperceptionists, as above stated.

To show that this selective synthesis really exists, not as a mysterious "principle," but as a legitimate inference from the observed facts, and that it is universal or common to all known aspects of nature and nowise restricted to the realm of mind, he draws a distinction between primary or intrinsic laws of nature and secondary or extrinsic laws. The primary laws of nature are inherent, constitute the active essence of the things, are the embodiment of their freedom. Thus the tendency of carbon to unite with sulphur is due to a primary or intrinsic law; their combination is, so to speak, an act of free will. Secondary or extrinsic laws are all forms of compulsion or constraint from without. Not stopping to consider here the elucidative applications of this view to the problem of free will, we must state that that "selective synthesis which we have seen to be a factor in evolution is an "intrinsic or primary law of nature; while the conditioning effects of the environ- "ment are secondary or extrinsic laws. Both are determinate, both are essentially "natural." This selective and synthetic tendency, again, is *active*, and its activity in the monistic view is regarded "as intrinsic in, and not external to, the happenings which we call natural" It is this activity that has moulded the inorganic by natural processes into the organic, and the organic into mentality. Selective synthesis is of the very essence of mental development.

Speaking of variations—a subject which falls in with this discussion—Professor Morgan says: "I am inclined to believe that they are determinate, the definite pro- "ducts of selective synthesis, and that mental evolution proceeds along lines which "are determined by intrinsic laws of mind, just as a crystal is evolved along lines "which are determined by the intrinsic laws of crystallisation." We have not the space to follow out the author's interesting applications of this philosophical view to the solution of the questions of heredity, variation, and mental development, except to say that he regards the latter as not dependent on natural selection through elimination.

We now come to the central object of the work, but for us subsidiary. The discussion begins with a beautiful exposition of the wave of consciousness, elucidated by a diagrammatic interpretation, which is one of the author's favorite and most powerful helps. The wave of consciousness has its summit, crest, or focus, constituting that brief moment of luminous awareness, when a being feels itself in living contact with reality; all besides this is marginal. It is in this marginal body of the wave, in the setting of the focus, that we must seek the relatively abiding elements which link the successive phases of the wave into a continuum. For empirical psychology this wave of consciousness constitutes the mind; its moments are our sole experience. Consciousness has physiological conditions; on the hypothesis of scientific monism the curve of the physiological conditions is identical with the

curve of consciousness, the two being aspects only of one indivisible reality. Now, just as the wave of consciousness has its marginal or subconscious elements, so the curve of the physiological concomitants has its dominant and sub-dominant elements: and, as psychical states seem to exist which do not enter consciousness at all, and accordingly are called infra-conscious, their physiological correspondents may, by analogy, be termed infra-dominant. This is the nomenclature used throughout the book; it will be found to reflect much of its speculation.

We are now brought to the main question of comparative psychology, the interpretation of "other minds than ours." Professor Morgan here avails himself of an analogy. He imagines himself a chronometer, and asks what would be his mode of inquiry and what its results, if he should seek to interpret the horological mechanisms of other time-pieces, say one so low in the scale as the kitchen-clock. The upshot of the analogy is apparent. Its conclusion, which is adopted as the fundamental canon of interpretation in animal psychology, is stated thus: "In no "case may we interpret an action as the outcome of the exercise of a higher psychi- "cal faculty, if it can be interpreted as the outcome of the exercise of one which "stands lower in the psychological scale."

There are two kinds of suggestions, primary and secondary, due respectively to external and internal stimuli. When the first is in the focus of consciousness, we have an *impression*; when the second is there we have an *idea*. The first is presentative, the second representative. Suggestion and association are explained by showing the vast complexity and continuousness of the wave of consciousness. Association is the sole means by which experience is made available for the guidance of animal action. Here seems to lie the germ of the much-mooted "control" of consciousness. What is inherited, Professor Morgan thinks, "is the mechanism "by which *an* association may be established; what is a matter of individual acqui- "sition is *the* association that is established."

Through a discussion of Memory, which Professor Morgan takes to be entirely desultory in animals and as not due to the perception of relations; of Impressions, where we learn that the real data of experience are states of consciousness, and that sensations are results merely of psychological analysis; of Synthesis and Correlation, etc.,—we are led to the consideration of sense-experience in animals, of automatism and control, and of instinct and intelligence, in which last connexion the well-known experiments with chicks and ducklings are introduced. Here we get at the heart of Professor Morgan's views on some of the most important psychological questions. For example, of the significance of consciousness in the control of life activities. He suggests as a possibility that there may be cerebral centres for the control of the activity of the sensory centres. He says: "In automatic acts, in so "far as they are accompanied by consciousness, such consciousness is a mere spec- "tator, but in controlled activities consciousness is more than a spectator,—it takes "the helm and guides." We have also a clue here to the psychological genesis in his mind of that fundamental synthesis which lies back of all evolution and is in-

herent in all being. Let us hear his own words: "Consciousness is essentially a "synthetic unity, and perhaps in this synthesis we may see a subjective aspect of "that universal synthetic tendency which we discern in diverse forms through- "out the objective world of nature,—a synthetic tendency which is seen alike in "the genesis of a raindrop, of a crystal, and of the solar system; in the exquisite "structure of the frustule of a diatom, in the form and brilliancy of a humming- "bird, and in the silken gold of a maiden's hair."

By *instinct* Professor Morgan understands accurate and adequate innate capacity for motor response; by intelligence he understands the power of selective control over such motor responses. Now, intelligence as thus defined, animals have, but reasoning powers, involving the perception of relations and the conceptual thought built thereon, they have not. This subject takes up several chapters and forms the climax of the discussion.

We may note here the use of a few technical terms. For Professor Morgan the perception of relations involves the focussing of the *transition* felt as the wave of consciousness passes from object to object and thought to thought. "A percept," he says, "is an impression set in a relational background"; this usage differs from that adopted in his former work, *Animal Life and Intelligence*. A concept is a percept generalised and stripped of all particularity. Three usages of the word "idea" are distinguished: (1) as a revival of impressions; (2) as a perception of a relation; and (3) as a generalised or universal concept. In the last case it is capitalised; in the second, it is italicised; and in the first, written in ordinary Roman letters.

Professor Morgan contends now that animals, although they have a dim, subconscious awareness of relations, yet have never focussed those relations in consciousness, so as to reach percepts. This is chiefly due to the fact that they have not the power of descriptive intercommunication, though they do have powers of indicative communication. Far less, then, have they powers of conceptual thought, the faculties of the "why" and the "therefore." Again, if animals have not the power of descriptive communication, much less have they the power of explanatory communication. If they cannot focus the *what*, still less can they focus the *because*. Here it is that the canon of interpretation, stated above as determinative, is applied with success and exactitude. Professor Morgan reduces all observed and reported observations of the reasoning powers of animals to intelligence such as he defines it. His emphasis of the importance of systematic and sustained observation as the only safe basis for conclusions concerning the intelligence of animals, as opposed to untrustworthy, anecdotal reporting, is significant of his position. He says: "I am "very far from wishing to occupy the false position of dogmatic denial of rational "powers to animals. I think it is a subject for further and fuller investigation. "But I do express the opinion that the fuller and more careful the investigation, "the less is the satisfactory evidence of processes of reasoning; and that, though "the question is still an open one, the probabilities are that animals do not reason."

We are tempted to say more of some of the minor and episodical applications

of Professor Morgan's views, for they embody a wealth of suggestiveness, but we must be content with emphasising the main points. It is only left for us to state that the perusal of the book cannot be too cordially recommended.

T. J. McCormack.

Lehrbuch der allgemeinen Psychologie. By *Dr. Johannes Rehmke*, o. ö. Professor der Philosophie zu Greifswald. Hamburg and Leipsic: Leopold Voss. 1894. Pp. 582.

As Professor Rehmke's views on a very important question of philosophy are discussed at length in this number of *The Monist*, we may be permitted here only to indicate in rough outlines the aims of his text-book of general psychology. It is a rather large book, but does not approach to the size of the new American treatises. Its object is to throw "light on the *general* problems that the psychic life presents and to point out broadly the path which the psychological student must follow in order to arrive at scientific clearness" on these questions. One might say it is intended more for educated amateur minds than for professional students. Accordingly, it is not overloaded with detailed discussions of special psychological questions, but attacks rather popular misapprehensions and the general philosophical aspects of the subject. In psychology, the author says, it is necessary for the inquirer also to be a philosopher, which is not the case in all other special departments of knowledge. We should rather say, he is consciously a philosopher in psychology, but unconsciously and dogmatically such in the other sciences.

The book is divided into three parts: the first treating of the nature of the soul; the second of the psychic moment or instant (*Seelen-Augenblick*); and the third of the psychic life. In the first, the philosophical questions come up for discussion; in the second the technical questions, as exploited by experimental psychology; and in the third, the questions connected with the "faculties," thought, memory, etc., and personality.

In the philosophical division the subject of the soul is first broached. All the various historical conceptions of the soul, according to Professor Rehmke, may be comprised under four general views: the ancient materialistic view of the soul as a thing; the spiritualistic view as of an incorporeal concrete; the modern materialistic view of the soul as a function of the brain; and finally the Spinozistic view of the soul as a side or aspect of man. All four lead, in the author's judgment, to indefensible results. Only the "spiritualistic" view can be regarded as a hint in the right direction, but it is not a solution for it never precisely defines what that nonthingish concrete, the soul, is.

The essence and keynote of Professor Rehmke's view are contained in his definition of the abstract and the concrete, which he regards as a most sure and fruitful instrument for the analysis of the data of the world. The "abstract" is the invariable; the "concrete" is the variable. For example, the datum of the soul is the (concrete) consciousness; and the so-called "subject" is a *moment* of consciousness,

where by "moment" is meant a *hic et nunc* (of consciousness). The author's discussion of this distinction between the abstract and the concrete, which lies at the basis of his work, is very suggestive; and the solution he offers will be apparent when we reflect that it is nothing more nor less than the purpose of abstraction to pick out and fix the invariable aspects of the fleeting world of phenomena. *μκρκ.*

MÉMOIRE ET IMAGINATION. By *Lucien Arréat*. Paris: Félix Alcan. 1895. Pages, 168. Price, frs. 2.50.

A more appropriate title for this book, the author says, would have been *La vie des images*. M. Arréat seeks to reduce the life and phenomena of imagination, first to images, and then to the organic base of images, memory. We all have memory, in some degree, but we have not all of us the same memory. We have all imagination, but not all of us the same imagination. As our images are,—that is, as our temperament, heredity, and physiological memory and environment are,—so is our imagination. This is the rule which M. Arréat seeks to establish by examining four intimately related professional types—painters, musicians, poets, and orators. He has divided this large group into sub-types, according as their memories are motor, visual, or auditive, and woven into his researches many attractive and instructive considerations. We have had occasion before to admire M. Arréat's wide acquaintance with letters, and we must praise here again the concise and skilful use which he has made of his bibliographical and literary knowledge in this extensive field. The reader will find the book replete with apt instances and anecdotes. Both on the literary and psychological side, the volume has high merits. *μ.*

IDEALE WELTEN IN WORT UND BILD. Reisen auf der vorder-indischen Halbinsel im Jahre 1890. Für ethnologische Studien und Sammlungszwecke. By *A. Bastian*. Berlin: Emil Felber. 1892. Pp. 289.

ZUR MYTHOLOGIE UND PSYCHOLOGIE DER NIGRITIER IN GUINEA MIT BEZUGNAHME AUF SOCIALISTISCHE ELEMENTARGEDANKEN. By *A. Bastian*. Berlin: Hoefer & Vohsen. 1894. Pp. 162.

DIE SAMOANISCHE SCHÖPFUNGS-SAGE UND ANSCHLIESSENDES AUS DER SÜDSEE. By *Adolf Bastian*. Berlin: Emil Felber. 1894. Pp. 50.

ETHNOLOGISCHES NOTIZBLATT. Herausgegeben von der Direktion des königlichen Museums für Völkerkunde in Berlin. By *A. Bastian*. Berlin: Emil Felber. 1894. Pp. 19.

There is perhaps no ethnologist living who can compare in breadth of knowledge or power of production with Prof. A. Bastian, the venerable and world-famous Director of the Berlin *Museum für Völkerkunde*. The four works listed above represent a tithe only of his recent activity, but show it in its best and in its worst features. It would be difficult to conceive a work containing more facts and really valuable ideas than that entitled "Ideal Worlds in Word and Picture," and it is to

be regretted therefore that it exhibits such a sore lack of methodical arrangement. There is absolutely no clue to the author's intentions, and the whole is one tremendous mass of interesting but unorganised facts. Added to this is an asperity and intricacy of style which renders the work almost inaccessible to readers who are not thoroughly familiar with the anfractuosities of the German syntax. In this respect Bastian is unequalled even by the worst of German writers. We shall quote merely one sentence taken at random, where, it is safe to say, the author is in his most elegant and lightest stylistic mood. There are plenty such in the work. He is speaking of the Buddhistic world-conception, and of the iron concatenation of cause and effect. The sentence is found at page 205 of the Proceedings of the Berlin Anthropological Society, April, 1894. It reads:

"Je nach den periodischen Zerstörungen,—durch Wasser (in vorübergehenden "Sinthfluthen und ihren in rechtzeitig gebauter Arche geschützten Coxcox oder "Noah), durch Feuer (in stoischer 'Ekpurosis'), durch Erdbeben (auf der Quichés "volcanischem Boden), durch Sturm (im antillischen Huracan)—, reicht nun die "Vernichtung weiter hinauf in die Rupaloka, so dass für die (nicht mehr by Stock "und Stein als Fetischismus stockenden, und auch) durch den Aufblick zu (side-"rischen) *θεοὶ ὁρατοι* (in des Inca's Zweifel) noch unbefriedigten Gedankenreihen, "[wenn über die Thronsessel (in Chlorus' 'sede caelesti') hinüber oder neben apo-"stolisch drittem, zweistöckigem Himmel (bei Severian) bis zu dem orthodox sieben-"ten (auch im Islam) reichend] ein Nichts entgegengähnt (in Immaterialität der, "ihrer Meditation geweihten, Terrassen),—ein Nichtsein, das (auf den Grenzen von "Sat und Asat, das Regen vedischen Tad's erwartend) in Sein umzuschlagen hätte, "nach philosophisch schönrednerischen Phrasen (bei Actualisirung des Poten-"tiellen)."

Compulsory courses in such rhetorical antics would set at rest forever the debates on the relative merits of language and science study. But with all these drawbacks the works of Professor Bastian are indispensable to ethnologists, constituting the sources of the subject as gathered by a man of sure perceptions and uncommon scientific abilities. The historical student and general reader, however, will have to wait until most of it is elaborated in a different and more intelligible form.

T. J. McC.

SYSTEMATISCHE PHYLOGENIE DER PROTISTEN UND PFLANZEN. By *Ernst Haeckel*. Berlin: Georg Reimer. 1894. Pages, 400. Price, M. 10.

The fundamental idea of a general phylogeny of the world of organic forms was broached by Professor Haeckel in 1866 in his *General Morphology*, and shortly afterwards developed in a more popular form in his *Natural History of Creation*. As the phylogenetic materials were scanty at that period, the author's researches were limited to the merest outlines of a history of the race; in the necessity of the case a rigorous scientific demonstration was impossible. The author now attempts such a demonstration, in the light of the materials recently furnished by palæon-

tology, ontogeny, and morphology. Thus, the reader will find incorporated here the results of thirty years of fruitful research.

Professor Haeckel's point of view has remained practically the same as when he first promulgated the idea. It is his aim to reach a scientific knowledge of the organic forms and of the causes that produce them by a study of the causal relations obtaining between phylogeny and ontogeny, the history of the race and the history of the individual. As is well known, he vigorously opposes the new theories of embryology and heredity, upholding in contradistinction to the latter the doctrine of progressive inheritance. There is much philosophical discussion and speculation in the work, as must be, for phylogeny, like historical biology, is a hypothetical science and can never hope to gain access to all the materials that would verify its conjectures. The tables of descent and the genealogical trees which Professor Haeckel has traced out are for this reason not put forward as perfected and rigid plans, but are to be taken simply as attempts at a reconstruction of ancestral history, and as indicating the way in which, according to our present knowledge, future phylogenetic research is perhaps to be best conducted. In cases of doubt, parallel hypotheses have been suggested.

The present work is not a text-book, but presupposes considerable knowledge of natural history on the part of its readers. Nevertheless, Professor Haeckel's style is delightfully lucid, and what with his explicit explanations of new terms and his profuse use of diagrams and counter-references, the intelligent reader who has access to a good compendium of natural history will not only have no difficulty, but will experience considerable pleasure, in the perusal of portions of this work. The volume before us treats of Protists and Plants, and is to be followed before the close of the year by the two other parts on vertebrate and invertebrate animals. A number of the most important sections of the present volume have been translated and are appearing in the current numbers of *The Open Court*. μ.

PSYCHO-THÉRAPIE. By *Doctors A. W. Van Renterghem* and *F. Van Eeden*. Paris: Société d'éditions scientifiques, 4 Rue Antoine Dubois. 1894. Pages, 291. Price, frs. 7.50.

By psychotherapy the authors understand not exclusively hypnotism, but the art of curing by psychical means generally. They claim that their work, as contained in this report of the Suggestive Clinic of Amsterdam, has yielded satisfactory results, notwithstanding the brief period of the existence of this branch of methodical medicine, and the opposition which it has met with in professional quarters. They point, it is said, to a fundamental revision of the principles of therapeutics. The book, which is addressed mainly to the medical public, consists of a complete statistical record of clinical observations made in the Clinic of Amsterdam from 1889 to 1893. The authors discuss in the introduction the general principles of therapeutics and some important fundamental biological problems. μ.

VERBRECHEN UND WAHNSINN BEIM WEIBE. Mit Ausblicken auf die Criminal-Anthropologie überhaupt. Klinisch-statistische, anthropologisch-biologische und craniologische Untersuchungen. By *Dr. Med. Paul Näcke.* Vienna and Leipsic: Wilhelm Braumüller. 1894. Pp. 257.

This work appeals primarily to psychiatrists and physicians only; but the questions which it touches are of grave import, affecting every profession and stratum of society. Amid all the intellectual and material advances of our epoch, crime and animality, instead of giving way before the general progress, have only increased in violence and intensity. The conditions of this deplorable state of things lie deep in the structure of the modern social organism, and it is the purpose of this book to contribute something towards the discovery of those conditions by the scientific method, as that has been applied in the asylums, prisons, hospitals, and schools. All this work is beginning to have its effect on legislation, which will be more effective the surer the foundations which criminology and psychiatry supply it. Dr. Näcke's book is devoted, as its title states, to crime and insanity in woman, discussing the subject under all forms and as developed by all the new anthropological and criminological methods. As Dr. Näcke has attained a recognised place in this department of research as a careful and trusty investigator, his researches will have high value and usefulness for the specialists of this department, and for all writers who now and then find it necessary to consult sources. *μ.*

UNSERE GEWISSHEIT VON DER AUSSENWELT. Ein Wort an die Gebildeten unserer Zeit. By *Dr. Johannes Rehmke*, o. ö. Professor der Philosophie in Greifswald. Heilbronn: Eugen Salzer. 1894. Pp., 47.

Prof. Johannes Rehmke's lecture on "Our Certainty of the Outer World," which has already reached its third edition, is a thoughtful investigation of one of the most fascinating of philosophical problems. The Professor argues: The problem whether the outer world exists or not is puzzling, for it strikes unsophisticated thinkers as being no genuine problem; we are inclined to add that they are perhaps after all right. We deem the pamphlet worthy of a synopsis of its arguments.

The outer world is to those untrained in philosophical questions identical with the space-given data of our experience, which are contrasted with our self, the soul, or the ego. Our body forms a middle position, but has consistently to be classed together with the outer world. To the thinkers of classical antiquity this problem of the reality of the outer world did not as yet exist; it was first produced by the emphasis which the Christian world-conception places upon the soul. The self-assurance of the soul makes it difficult for us to find our way to the reality of the space-given objectivity, and in this sense St. Augustine prepares the way for Descartes's universal doubt of reality. The *cogito ergo sum* is the result of the Christian idea of the all-importance of the soul. The thinkers of antiquity looked outward to observe nature. The Christian looks inward and finds in the soul the starting-point of all philosophy.

Shall we consider reality as a product of the soul, and the self-made spook of our thoughts, which is the ultimate consequence of the Cartesian doubt? Or, shall we, after a purely theoretical skepsis, return to our belief in reality on the crooked way of a fallacy? There are many thinkers who merely play with their doubts, and are in the end satisfied to justify their belief with sham arguments. The trouble with the problem is, that the source of the quandary lies in the premises. If we consider the soul alone as given, we cannot from its purely psychical nature deduce reality. We move in a circle, and Kant drew the last conclusion by showing the ideality of space. According to his *Critique* we must distinguish between the outer world and space, for he deprived the outer world of spatial extension, which he regarded as a pure product of the representation of the soul. Thus no one can get out of himself, indeed, nothing out of itself. And the idea of the outer world would only be due to our imagination. It would be like the *processus vermiformis*, a rudiment of former periods of our evolution. Modern thinkers, men like Helmholtz and Zeller, appreciate the futility of proving the existence of the outer world and regain it indirectly. They maintain that sensations must have a cause which does not lie within us, and must be sought without. But is not this a *petitio principii?* For the very notion of them is assumed, and this indirect way of recuperating reality is inadmissible. The sense of resistance becomes possible only through a consciousness of the outer world.

Professor Rehmke solves the problem by declaring that the idealistic psychological standpoint is suicidal. Every one must recognise "the fact that even the keenest thinker cannot get rid of the outer world." "The outer world is as much *immediately given* as our own self, and we are immediately conscious of it" (p. 33). This conclusion is corroborated by the statement that "the outer world, being immediately certain, has this in common with the soul that its reality cannot be proved" (p. 34), and it is emphasised by repeated affirmations such as *selbstverständlich* (pp. 34 and 37) and *zweifellos klar* (p. 36). The cause of the trouble, the Professor says, lies in the wrong conceptions of the soul as something that exists in itself. Soul is neither a spatial being animating the body, nor a function of the brain. It is immaterial, and we must be consistent in thinking the idea of the immateriality of the soul. Soul is unspatial; it is nowhere. If it had its seat in the body or somewhere in space, it could not be soul. Outer world and inner world are two abstract pieces of the one world which the soul has in its possession.

It is possible that we should upon the whole agree with Professor Rehmke's arguments and solution, if we could make sure that we understand his terms as he means to use them; but we should express and present them in a different way. There are, however, a few points which make us doubt whether the disagreement is purely verbal.

We would indeed join the unsophisticated in saying that the question as to the reality of the outer world is indeed a wrongly formulated problem, which to show its futility might be formulated in the words, "Is reality real?" The term "real-

ity" has reference to the condition under which certain sensations originate. The questions as to the uniformity of the laws of reality and as to its attributes, whether it is intrinsically material, or spatial, or spiritual, has nothing directly to do with the problem of the outer world, and is of a more complicated nature. The space-world of our imagination is our method of representing reality; it is that which is meant when a sentient being, by a resistance of some kind, feels its own limitation. There is neither outerness nor innerness of the world, but the outer and the inner are mere aspects. A fraction of existence, called *A*, if viewed from *A* is called the soul aspect or innerness; if viewed from some other standpoint, say from *B*, it is called body or outerness. Soul, it is true, is in a certain sense, as Professor Rehmke maintains, nowhere. But this paradox simply means that from the abstract soul the idea of space is excluded. The ideas which I read in Professor Rehmke's pamphlet, are for the same reason and in the same sense, nowhere; nevertheless, the words which they express are to be found on these printed pages. The ideas as such are unspatial, but the words in which they manifest themselves are either moving in brain substance or vibrating through the air, or appear as black specks of peculiar forms on paper. Thus the brain structures which are agitated while ideas are thought exist in the body and are a part of the body. In this sense, the idea of the nullibiety, or nowhereness, of the soul is quite correct, and there is no mysticism about it.

The reader of Professor Rehmke's lecture cannot help thinking that if the outer world is after all an "immediately given fact," the whole investigation is futile, as Mephistopheles says in Faust, "*Wozu der Lärm*"; and the standpoint of the ancients, who did not know of the problem, would after all be justified, and indeed there is a truth in this idea which I suppose Professor Rehmke will not deny. The question is not whether reality is real, but, What is the proper definition of reality?

The idea of reality is unthinkable without resistance; indeed, it is a synonym of resistance, and resistance felt is only another name for experience, which is the basis of our psychic activity and the source of all our knowledge. Resistance felt is called sensation. If a sensation takes place, the sensation is real, it is a fact, and sensations alone are immediately given facts.

Every sensation leaves (as we learn from physiology) in the sentient substance a vestige which is preserved, and which when irritated causes a repetition of the original feeling—a condition which is called memory. When another sensation of the same kind as the first one takes place in the same sentient substance, it enters the memory vestige of its predecessor and revives it. This act is, according to the late Romanes, most appropriately called reception, and the second sensation thus becomes a recept. By reception a new psychic phenomenon is created, for the sameness of the two sensations (be it ever so dimly) begins to be perceived; it becomes a percept which indicates the presence of the conditions of a sensation. This additional element, the representativeness or symbolic nature of sensations, is the life of the soul. Now when we speak of reality we mean facts, viz., sensations, i.e.

immediately given facts, or such conditions as by resistance will directly or indirectly produce sensations; and when we speak of something as being "unreal," we mean that the meaning of some psychical symbol, of a sensation, or of an idea is the product of a fallacy. The sensation of a red object leaves a blue after-image. The red-sensation is real, and the blue-sensation of the after-image is real, for both are immediately given facts. The percept of a red body is also real, for it means that conditions exist which by contact, viz., through resistance of some kind, will produce certain other sensations. When the red object is touched, the anticipation is verified, or, as we say, "realised"; but when attempts are made to grasp the blue object, our anticipation is deluded and there are no such conditions as were supposed to exist: in brief, the blue object is unreal. Bodily existence, i. e., matter moving in space, or outerness, is the mode by which reality or resistance is represented. Bodily existence, or matter moving in space, accordingly, is not the real world, but reality as it appears to sentiency; it is one aspect only which may be called the outerness of being.

Professor Rehmke leaves some doubts in the soul of his reader, not only (as we have indicated above) as to the soundness of the solution of his problem, but also on other subjects which are touched upon incidentally. Professor Rehmke says: "Every thing is only itself" (p. 39), which is used as an argument to refute the idea that the body could contain in it the soul. Nevertheless, he makes the soul contain the world, and the world consists, according to him, of things as well as of feelings and impulses. (P. 43.) Thus he would after all either have to accept the idealistic solution, so vigorously rejected by him, or must spite his own logic and declare that "everything is not always only itself, for the soul contains the world together with its own brain and possesses as one of its parts the material bodily reality."

We have given so much space to this small pamphlet, because it is suggestive and many expositions are well put. Moreover, the problem itself is of importance and its treatment affords a good touchstone for the value of a philosophy. P. C.

ALLGEMEINE GESCHICHTE DER PHILOSOPHIE. MIT BESONDERER BERÜCKSICHTIGUNG DER RELIGIONEN. By *Dr. Paul Deussen*, Professor in the University of Kiel. Leipsic: F. A. Brockhaus. 1894. Pages, 336. Price, M. 7.

Prof. Paul Deussen's work is a new departure in writing the history of philosophy; before us lies only the first part of the first volume, but the Introduction and the Prospectus explain the plan of the book, and the treatment of the first instalment is very promising and sufficient evidence of the author's ability to cope with all difficulties. The work will not only be more voluminous than any prior book of the same kind (it will comprise six volumes and may take years until it is completed), but it is also designed on a broader plan. It is the author's intention to widen the scope of his task in two ways. First, he generalises the idea of philosophy so as to include religion; and, secondly, he does not limit himself to the

Western world, but gives an exposition also of the philosophical evolution of the East. In addition, he proposes to attempt "a revision of philosophical and reli-"gious doctrines by the facts of nature and life on the basis of which they have "originated." The whole plan is unquestionably good and shows that the author has read the signs of the time.

The old histories of philosophy present the evolution of our own philosophical thought only, and consider the philosophies of other nations merely in so far as they have influenced us. A comparative view which would discover the laws of philosophical evolution does not in this way appear possible. Deussen is very well aware of the advantage which our knowledge of the East Asiatic philosophies will afford us. He says:

"Their main value to us who have been educated in the classic antiquity of "Greece and the Bible lies in their radical difference from, and independence of, "the Occidental mode of thinking. Indeed, it remains to be seen whether and how "far a sufficient knowledge of Indian wisdom will produce a revolution in the reli-"gious and philosophical thought of the Occident, which will affect it not so much "on the surface as in its very essence. Any one who has had occasion to be in per-"sonal contact with Indian thinkers and sages of the present time will have been "especially surprised by the observation that in spite of their keenness, profundity, "and extended knowledge, they move within extremely narrow limits and are confined "to a one-sided conception without knowing it. Who can say whether a similar "one-sidedness and limitation are not attached to ourselves and to the traditional "ideas in which we have grown up. And it may very well be that we can learn, "albeit in a different way, as well from the Hindus as they have to learn from us."

There are many thinkers of prominence who declare that a radical difference obtains between ethics and religion, science and religion, and philosophy and religion; they are not aware of the fact that the religion of a man colors his entire being; be it for good or evil, it influences his science, it permeates his philosophy, and it finds expression in his conduct. Indeed, every religion is a popular philosophy, and every philosophy, if but the philosopher is serious in his convictions, is a religion. Both religions and philosophies are world-conceptions applied to practical life. There is one difference only: religion is a philosophy indorsed by a great number of people, while philosophy is the world-view of a single thinker. Dogmas and mystical speculations may appear strange to a scientist whose attention has been limited to the field of his specialty. And a child of these latter days of the nineteenth century is inclined to think that such abstrusities should have no place in the history of philosophy. But we must bear in mind that they are attempts to comprehend something that possesses not only in the mystic's mind, but also in this real world of experience an unquestionable reality. Visions of a Jacob Boehme are expressions of his living experiences, indicating the presence of very important facts which in the shape of a dream become tangible; but they certainly well up from the deepest depths of their author's soul. Says Professor Deussen:

"We should have to omit the very best of that which we are, however, should "we exclude the religious element from our consideration. Consider only that "everywhere, in India as well as in Greece, and also among us at the present time, "the most vital and fruitful germs from which philosophy grows have been pre- "pared in the soil of religion. Indeed, up to recent times, philosophy in a good as "well as in a bad sense stands scarcely less under the influence of religious than of "philosophical tradition. Every attempt to understand the present state of philos- "ophy in its roots leads us back as much to Jesus and Paul as to Plato and Aris- "totle."

As to Professor Deussen's promise to "revise the philosophical and religious "doctrines by the facts of nature and life on the ground of which they have origi- "nated," we are as yet doubtful what he means. A revision of our philosophy and religion is needed on the basis of the facts of nature, which means that we have to reconstruct philosophy and to reconsider the value of former speculations on the basis of science. This, however, it appears Professor Deussen does not do; his revision seems to be purely historical, being a critical inquisition into the civilisation, climatic influences, etc., etc.

We hail Deussen's enterprise because we believe that a work wrought out on this new plan, which broadens as well as deepens the significance of philosophy, is much needed, and we expect that the old facts, when seen in a larger connexion, will appear in a new light. But we are sorry to notice that in one point Professor Deussen does not appear to see the problem of modern philosophy clearly. He is not yet prepared to seek the well-springs of philosophy in experience alone, taking here experience in the broadest sense of the word, including in it the inner and the outer, the concrete and the abstract, the sensory and the purely formal. To Professor Deussen, philosophy is still "the search for the thing-in-itself," and its most essential characteristic is, in his opinion, to supply a *principle* from which the world and its phenomena may be comprehended. In a word, he places philosophy outside of the sciences and above them. He does not use the word "super-scientific," but he virtually makes philosophy super-scientific, by saying, that "while all other sciences are physical, philosophy is metaphysical."

Professor Deussen leaves us in the lurch as to his meaning of the word "metaphysical." For on the one hand he declares that philosophy "does not go beyond experience in a transcendent way, but penetrates it in order to seize its kernel." This passage indicates that his "metaphysical" must be conceived of as a part of experience, as something that is to be found *in* experience, constituting its most essential element. On the other hand he says: "We meet with a striking pecu- "liarity common to all elaborate philosophical systems, that they find it necessary "to propound a *principle* from which they attempt in various ways to comprehend "the existence of the world and its phenomena."

This principle, which, in our opinion, must be derived from experience, appears, according to Deussen, to lie beyond experience, for he takes it to be "a most

"essential feature that philosophy regards the totality of empirical reality—howso-"ever clearly it may lie before our eyes—as something which is in need of a *still* "*further explanation*; it regards it as a problem demanding a solution, which means "that it points beyond itself."

From our standpoint, the solution of a problem can never point beyond itself, but must be derived from the field of our inquiry. It may be necessary to enlarge the field of our inquiry in order to attain a solution. It may also be necessary to complete the field of our inquiry, if a survey of all intercoherent facts is impossible, by the assumption of hypothetical facts, the reliability of which may be more or less doubtful. But under all circumstances a principle of explanation must be contained in the facts to be explained. That which is hidden must be made visible. That which is obscured must be brought into light. The material of our experience must be worked out and systematised, but any attempt at seeking for a principle that leads beyond experience will involve us into mysticism, dualism, or agnosticism.

In corroboration of his definition of philosophy, Professor Deussen quotes the "principles" proposed by various systems: the âtman of the Vedânta, the prakriti and purusha of the sâñkhyam, the tâo of Lâo-tsze, the ἀριθμὸς of the Pythagoreans, the unknowable thing-in-itself of Kant, Fichte's ego, Schopenhauer's will, and the idea of matter of the materialists. Granted that many philosophers actually seek for a principle of explanation that points beyond itself and would have to be considered as foreign to the reality such as we perceive it in experience, we cannot say that this aspiration is characteristic of all philosophy, and the editors of *The Monist* would have to deny their own view the name of philosophy.

Professor Deussen says that the history of philosophy is to some, eternal truth kaleidoscopically reflected in the glass of genius, while to others it is the repertory of the various errors of the human reason, a superfluity which they would discard if they did not respect the accounts of them as historical facts. Professor Deussen himself takes another view. He says:

"He who with his eyes can see the horse only and not horsehood [referring to the well-known passage,[1] ἵππον μὲν ὁρῶ, ἱππότητα δὲ οὐχ ὁρῶ] cannot be helped even by a Plato redivivus, but much can be done to disperse the fog which from birth lies upon the eyes of us all, so that we shall see things not merely empirically, that is, from the highly one-sided observatorium of our own intellect, but be led to a higher standpoint, from which we can view intellect and nature in their mutual counter-operations—which at bottom is the gist of all philosophy. Collating, sifting, and combining the records is not sufficient, still less, mere reflexion, critical analysis, and vituperation. All these things are at best a mere μίησις through which we must come to an ἐποπτεία, an inner intuition; and the nearest and most urgent aim of the

---

[1] *Simplic. in Arist. Categ., scholia*, ed. Brandis, p. 66, v. 46.

history of philosophy is to show us the nature of things, internal as well as external, with the eyes of every single philosopher."

So far we perfectly agree with Professor Deussen. We also see in things not isolated items, but parts of a whole, the interrelations of which manifest the omnipresence of the same cosmic order throughout. The forms of things are real and the ἱππότης is that which constitutes the ἵππος. But we deny that the ἱππότης is a thing in itself; it is a part of the real world and must be understood as such.

We certainly do not slight Kant when we reject his conception of a thing-in-itself, and we also understand that the ultimate principles of explanation, which appear to many philosophers as transcendent entities, are in their systems a kind of internal adytum, a *sanctum sanctissimum*, where, to a great extent, (as in religious dogmas and the speculation of mystics,) intuition takes the place of intellection. We even respect the awe of a Kant and also of other minds of a smaller compass, who when confronted with the difficulties of these ultimate questions, give up the solution and utter unintelligible words on the transcendency of the object of their investigation. But for that reason we must not be frightened away from attempting to understand the nature of the metaphysical, so called, which we find to be a part of experience, and not something that points beyond reality. We may admire Kant's philosophy, and yet find ourselves obliged to discard the most favorite ideas of his, which are the incomprehensibility of the thing-in-itself, and the very notion of the thing-in-itselfness of things.[1]

Taking this ground, we do not agree with Professor Deussen's idea, that if philosophy existed on other stars that its final outcome would be there, as here on earth, the recognition of limits drawn by nature herself, for we do not believe that, little though we may know, nature draws any limits to either a scientific or a philosophical insight. Nature is intelligible so far as our contact with nature goes. And if there are limits, they are drawn by us. Still less can we concede that man's mind will actually find satisfaction in the oppressive idea of the unsurmountability of the limits of comprehension. Yet, when Professor Deussen comes to speak of the practical application of philosophy, saying that when considering the means by which to satisfy the inborn instinct of a pursuit of happiness they will inevitably come to the conclusion that the highest aim of man will not be the satisfaction of this instinct, but its conquest, and a deliverance from the fetters which the insatiable desire for pleasure imposes upon us (p. 7).

The preliminary plan of Professor Deussen's work is to discuss (1) Indian Philosophy, (2) Greek Philosophy, (3) The Philosophy of the Bible, (4) The Philosophy of the Middle Ages, and (5) Modern Philosophy, the latter being divided into three periods. The first of them (1400–1600) comprises the Reformation and the over-

---

[1] As to the views of the editor of *The Monist* on Kant's position, we refer the reader to the article "Are there Things in Themselves" (*The Monist*, Vol. II, No. 2). Another editorial article on the rôle which the metaphysical x plays in cognition will probably appear in the next number of *The Monist*.

throw of Aristotle's authority; the second reaches from Cartesius to Kant (1641–1781); the third from Kant to the present day.

Considering the ethical valuation of a conquest of the desire for happiness, we are surprised to find that Buddhism receives but slight attention. It is mentioned twice only in the announcement of the general plans in Chapter V. of Part III. of the first volume among the heterodox systems of Brahmanism and in the fourth chapter of the appendix of the first part as one of the three great Chinese religions.

The difference between Professor Deussen's and our own views will not be of great importance in the history of the ancient systems, but it will be more apparent in the last, and as yet unpublished, portion of his work. Professor Deussen says of this last period in the general introduction (pp. 20–22):

"It was Kant who after so many vagaries of human thought proposed the ques-
"tion, whether we have at all in human reason a fit tool to transcend experience
"and to discover any tenable propositions concerning such transcendent objects as
"soul and God."

Kant, in our opinion, was right in denying to the faculty of reason the power of transcending experience, but we will add that this feat is not required of reason. Reason is a fit tool to extend experience, to deepen its significance, to systematise its data and arrange them for a handy application to practical life. The ideas God and soul, if considered as transcendental objects are empty metaphysical speculations without any practical value, and, indeed, being *ex hypothesi* transcendent, also without any theoretical value. We do not find them in our experience and can safely say that we know nothing of them; therefore we need not bother about their existence. Whether transcendent existences exist or not, affects us in no way. We shall see, however, that the terms God and soul have been invented to denote some most important features of reality, such as we find in experience, but in this latter sense they are neither transcendent, nor metaphysical, nor unknowable, but form, whatever name we may give them, the daily bread of our intellectual, moral, and emotional life. Kant when investigating in his *Critique of Practical Reason* the part our ideas of soul, of cosmic unity, and God play in our moral aspirations, left the most important part of the philosophical problem which he attacked, as he found it. The fallacies of metaphysicism he put down as paralogisms of reason herself and sanctified them for practical purposes in the shape in which our religious traditions had cast them. Instead of keeping two contradictory accounts, one for theoretical and the other for practical reason, he should have proceeded to purify the meaning of these practical ideas in the furnace of pure reason. By the elimination of their metaphysical interpretation he could have reduced them to their proper significance in practical life, and would thus have at once corrected the error and explained its origin. This work, left undone by our great master, is the task we have set ourselves to accomplish.

Deussen continues:

"His investigation into the nature of reason induced Kant to subject the whole

"apparatus of cognition to an unprecedented critique and examination, the result "of which was the indubitable proof that it was impossible to go beyond experience, "and at the same time a radical destruction of all speculations concerning soul, the "world-totality, and God. On this occasion Kant made the greatest of all discov- "eries which ever was made in our science, viz., that certain portions of empirical "reality which we naturally regard as belonging to the outer world, space, time, " and causality, are in fact nothing but inborn forms of our own faculty of cogni- "tion."

The reviewer's own mind has been trained in the school of Kant, and he reveres him as the master at whose feet he sat. Nevertheless, he regards this so-called greatest of all discoveries as a great mistake,—*great* in the best sense of the word. It is a grand mistake because it was due to the boldness of a great thinker who took the consequence of an error seriously and dared to think out its consequences. Kant courageously drew the inferences of his error in spite of their absurdity. In the opinion of the reviewer, Kant was right in his distinction between the *a priori* and the *a posteriori*, but he was wrong in attributing the former exclusively to the subjectivity of our mental conceptions. All the *a priori* sciences are ideal, as Kant says, but Kant uses the word "ideal" in the sense of subjective, and this confusion of ideality and subjectivity is the error hidden in the foundation of his philosophy. And Schiller says:

> "Let but an error be hid in the stone of foundation; the builder
> Buildeth with confidence on: never the error is found."

Kant being unable to derive the *a priori* from experience which he unfortunately limits to and identifies with the *a posteriori* or the sense-element of experience, seeks his principle of explanation beyond experience in "the thing in itself," and Deussen accepts Kant's position. He says:

"The consequence of Kant's great discovery was that the world, such as we "know it, viz., extended in time and space and regulated by causality, is in this its "form a mere phenomenon and not a thing-in-itself."

Kant leaves us in doubt, and Professor Deussen will probably not be able to explain to us what Kant really meant by thing-in-itself. It may mean (1) the object as it is independent of sensation, or (2) the object as it would be in itself, i. e., the object's subjectivity; what we might call the soul of the object; or perhaps (3) the metaphysical condition of physical existence, the *raison d'être* of being and its ultimate ground. The cognition of the thing-in-itself in the first sense, is the domain of science. The objective reality which produces the subjective phenomenon of a rainbow is by physics supposed to be a certain refraction of ether-waves. The colors of the rainbow are a phenomenon that exists in the eye only; but the ether-vibrations are an objective process which is supposed to take place whether or not any eye perceives it. The thing-in-itself in the first sense is not incomprehensible. As to the thing-in-itself in the second sense, which is the subjectivity of the objective existence, we must bear in mind that it stands to its sense-perceptible existence,

as a material object appearing in time and space, in the same relation as our soul stands to our body, and we have good reasons to believe that its nature exactly corresponds to the structure of its bodily appearance, so that in lower animals it is as different from man's soul as is the animal organism from the human organism; while in inorganic nature it is on a still lower plane. Finally, the thing-in-itself in the third sense is perhaps not different from the thing-in-itself in the second sense; for we are justified in assuming that what we commonly call the soul of man is the core of his being which manifests itself in his bodily appearance. To invent in addition a metaphysical principle, whether we call it with Fichte the ego, or with Spinoza substance, or with Jacob Böhme God, or with Schopenhauer the will, is perfectly gratuitous. All these terms are names originally invented to define a certain part of existence which is felt to be of great importance and may allegorically be called the innermost kernel of being; but as soon as they are supposed to lead beyond experience into a transcendent sphere, we enter the realm of dreams. So far as these ideas denote a feature of our real experience they are helpful, but as soon as they assume the existence of extra-experiential entities they are redundant, and we can very well do without them. Our soul is real enough such as it appears in the facts of life, and God is great enough such as we comprehend him, as the superpersonal omnipresence in the universe constituting the ultimate authority of moral conduct. According to Deussen:

"Kant considered the essence of the thing-in-itself as theoretically unknowable, "yet he opened upon it in the second and practical part of his philosophy an out-"look by referring moral action to an *a priori* innate moral law which he called a "categorical imperative, and this he declared to be the law which man as a thing-"in-itself prescribes to man as a phenomenon."

Mentioning among the successors of Kant such men as Fichte, Schelling, Hegel, and Herbart, who "hoped to overcome in an offhand way the difficulties discovered by Kant," Deussen adds:

"In opposition to them, Schopenhauer attempts to comprehend Kant thor-"oughly, and to free his doctrine from the weeds of misunderstood traditions. "Upon this foundation he applies Kant's ideas, in the direction pointed out by him-"self, in such a way as to make Kant the founder, and Schopenhauer the perfecter "of a unitary metaphysical system built upon experience alone, and thoroughly "consistent in itself. As such it appears in its practical part as a Christianity which "in its full profundity is renewed upon a scientific basis, to remain, as far as can "be foreseen for the ages to come the foundation of all scientific and religious "thought of mankind."

Schopenhauer and Kant are both great, and we regard a study of their works as the indispensable school through which the philosophers of the future will have to go, but we cannot share this opinion of Professor Deussen, who, we are firmly convinced overlooks the great errors which these masters of thought have propounded.

As to the contents of the first part of Professor Deussen's general history of philosophy we can be brief. After an introduction into the historical conditions of philosophical India, he discusses in the first part the old Vedic civilisation and religion. The origin of philosophy begins with the commencement of doubt, and leads to the first dawn of the idea of cosmic unity, to speculations on the origin of the world, and also to the seeking after the unknown God which aspiration manifests itself in the Prajâpati hymn and other religio-philosophical poetry. The second period is the age in which the Brahmanas were written, and we observe how in an evolutionary progress the Indian mind finds a solution of the world-problem first in the mythological idea of Prajâpati, then in the ritual conception of Brahman, and at last in the philosophical theory of the âtman. As Professor Deussen, the author of the *System of the Vedânta*, is one of the best authorities on the history of Indian thought, it would be bold to make any critical remarks, the more so as the presentation of the subject is at once clear and concise.[1] We have here, in about three hundred pages, the matured *résumé* of all that has been heretofore written on the subject by the author as well as by other Sanskrit scholars. We need not add that this great picture of the evolution of Indian thought is as grand as it is interesting, and will, aside from its connexion in the general history of philosophy, be welcome to many who desire to have an authoritative and precise presentation of the subject.

P. C.

Die Prinzipien der Mechanik. In neuem Zusammenhange dargestellt von *Heinrich Hertz*. Mit einem Vorworte von *H. von Helmholtz*. Leipsic: *J. A. Barth*. 1894. Pages, 312. Price, M. 12.

A melancholy interest attaches to this work. Its brilliant author who had little more than begun his scientific career, but in that beginning achieved so much, died shortly before its completion in his thirty-sixth year; and not long afterwards, his master, Helmholtz, with whom his scientific and personal relations had been so intimate, and who supplied a preface to the book, that is not the least of its attractions, followed him. Hertz's *Mechanics* represents the fruits of the last three working years of his life, and he worked until its close. The first part of the performance had, on the author's death, already received its definitive form; the second was completed in all essential points and was only waiting a final revision: this was left to Mr. Ph. Lenard, who fulfilled the task in accordance with the author's wishes.

In a charming Preface, filled with profound *aperçus* into the psychological genesis of scientific thought, Helmholtz sketches the career of Hertz, telling us what

[1] The problem of a proper transcription of names and terms is still unsolved. It would be a blessing if our Sanskrit scholars could at last come to an agreement on the subject. In Professor Deussen's transcription of Indian names, all masculine nouns end in *a*, all feminine nouns in *â*, and all neuters in *am*. This may be convenient for German readers, who have still to bother about the three genders, but the method is inconsistent, as in this way neuters appear in their nominative forms, while the words of masculine gender are transcribed in their stem-forms.

made him so peculiarly fitted for his task, what his education had been, and by what preliminary work he had been led to his celebrated electrical discoveries. We see here what a genial character his was, and shall find that the influences which shaped his career in the branch that made him famous also left their impress upon his thought as it is embodied in the work before us.

The present work is important mainly in two directions. First, as a *philosophical discussion* of the principles at the basis of theoretical mechanics; and, secondly, as an attempt to *new-model* logically and æsthetically those principles, as contradistinguished from the practical working-rules of the science, which, as they already serve their appointed purposes, are left untouched. Whatever shall be its ultimate fate as fulfilling the conditions required in the last-mentioned attempt, its significance in the first cannot be overrated. Hertz's philosophical introduction has all the marks of candor and sincerity which distinguished his earlier performances, and which he possesses in common with most great inquirers of the first rank. As Helmholtz says, we possess few records of the inner psychological history of science that are comparable with them. To this philosophical introduction, therefore,—and this is the only side on which Hertz claims originality,—we shall devote the chief space of this review, reserving only a few remarks for the mathematical and technical form of the new system. The philosophical assumptions at the basis of scientific method lie nearer to the heart of their work than many inquirers imagine; the very repudiation of metaphysical speculations, now so common in physical treatises, constitutes, itself, a metaphysical assumption demanding verification, and involves, expressed or not, a special philosophy.

But first a word with respect to influences. In all that relates to the formal complexion and mathematical execution of his plan, Hertz owes his first stimulus to Helmholtz. Next to Helmholtz the English influence is noticeable, and naturally, for under that influence his renowned electrical researches began. In the philosophical direction his views have been powerfully influenced by Prof. Ernst Mach; in a general way they lean toward the Kantian standpoint, though embodying features of various, and even opposed, schools.

The author begins by inquiring what are the criteria of sufficient or adequate knowledge. The fundamental object of all natural knowledge, he says, is to enable us to predict future events, with a view of controlling our conduct. The means by which we foretell futurity is present or previous knowledge. The method is this. We construct for ourselves inward images, pictures, or symbols of outward objects, so fashioned that the results that follow logically and necessarily from the images are in turn always images of the results flowing naturally and necessarily from the objects. This presupposes a determinate correspondence between nature and the mind, which experience teaches us exists. Having sketched out, or had given to us, such pictures, we can reproduce by them, just as we should by models, in a short period of time, events that in the outward world take long periods of time to happen in.

Now, that such pictures should fulfil their purposes what must be their attributes—what is required of them? Different pictures of the same object are possible. What gives to any one preference over any other? Hertz says, we should refuse *ab initio* to admit pictures which in any form involve contradictions against the laws of thought. In a word, our pictures should all be *logically* admissible. This is the first criterion, and we shall refer to it henceforward as self-consistency or *admissibility*.

Secondly, our pictures should be *correct*; their essential relations should accord with the relations of outward things. Thirdly, two self-consistent and correct pictures of the same outward object may differ with respect to *appropriateness*. That picture of the same object is the most appropriate, the most fit, which mimics the most essential features of the object. Where all are equally distinct, that picture is most fit which contains fewest superfluous features—which is simplest. But this last requirement is never ideally fulfilled.

With respect to the scientific or methodological presentment of the pictures, the requirements take a slightly different shape. Such a presentment must show distinctly what properties the pictures have been invested with to secure admissibility, what to secure correctness, and what to secure appropriateness. Only in such a way are we rendered perfect masters of our mental portrait gallery and enabled to change and improve it. For appropriateness sake, terms, definitions, abbreviations are added. This class includes all arbitrary features. The experiential elements constitute the aspect designated correctness. The attributes of rational thought supply the conditions of admissibility.

Whether a picture is admissible or not we can decide *a priori* once for all; whether a picture is correct or not, can be ascertained well enough with respect to present experience, but not for future experience; whether a picture is appropriate or not, can never be determined, at least unequivocally, but admits of wide differences of opinion. Only by slow, tentative quests is relative certainty to be reached on this head.

Such are the formal points of view from which Hertz proposes to estimate physical theories and their forms of enunciation, and from which he minutely examines the hitherto prevailing systems of mechanics with a view to establishing and justifying his own. Those systems, or pictures, are three.

The first picture is the common presentation of mechanics, as it is found in nearly all text-books. Its fundamental concepts are those of space, time, force, and mass. Powerful as this system is, and successful as its application has been, nevertheless, grave doubts as to its logical consistency, its admissibility, have arisen in the minds of philosophical inquirers. Differences of opinion have existed as to the mathematical certitude of many of its propositions. Such has been its unsatisfactory character, its intellectual uncomfortableness, that even its most useful and fundamental working concept, force, has been brought before the bar and the agnostic verdict rendered that its nature is mysterious.

Here Hertz interpolates a discussion, which is full of light. We often hear the question, What is the nature of electricity? But might we not just as well inquire, What is the nature of gold or of velocity? Is the one better known than the other? Whenever we ask such a question, we seek what cannot be given in words. The trouble here, according to Hertz, is, that at the mention of gold and velocity no relations are assigned that involve subtle and obscure self-contradictions; but in the case of force and electricity more relations have been grouped together than are perfectly compatible with one another. We have a dim presentiment of this, and our search for light is expressed in the obscure, unintelligible question above mentioned. The obscurity is well illustrated by reference to Newton's laws, where force, in the second law, has only one directional aspect, but in the third, two. Now this dissatisfaction, the author claims, is not to be removed by the discovering of new and complex relations, but by the lessening of the relations huddled together in the fundamental concepts. In other words, remove the self-contradictions and the question will answer itself.

What, now, is the upshot of all this? We have cast grave doubts upon the admissibility of the system; why does it always give useful and assured results? It must be, that the obscurities in question affect not the essential aspects of the mechanical picture, that is, do not consist of contradictions between the relations corresponding to the actual relations of the things; but relate to the unessential features, to that which we have mentally and adscititiously annexed to the materials supplied by nature. In a word, the faults are logical faults of form, not of contents. Here is where the new critical work is to be done, and it will consist in clearly stating and distinguishing what in our mechanical picture of the world is matter of intellectual necessity, what matter of experience, and what of arbitrary convention. The obscurity here gathered has pervaded the elements so thoroughly, as to establish the dogma of their eternal validity. Matter of *a priori*, intellectual necessity has been merged with matter of experience, and the conviction of universal certainty in time and space arising from the former has been transferred and predicated of the latter. All we can truly say, however, is that the correctness of the traditional mechanical picture is limited to actual, present experience.

The natural method, by which science has always grown up, is the reverse of the speculative, critical method by which it is sifted and clarified. In the natural process the mental pictures are first found to be appropriate, then are put to the test of their correctness, and only finally freed from logical self-contradictions. This explains why the common system of mechanics exhibits eminent appropriateness, as applied to the simple phenomena which it was originally invented to explain. But to-day we must consider it in connexion with the whole field of physical knowledge, if we are to judge of its appropriateness in its fullest sense, and with that in view must inquire, Is our picture perfectly *distinct*? Does it embrace every feature now discoverable in natural motions, and only such? We must answer, No. The system does not comprehend all the mooted aspects of the so-called

elementary forces. Moreover, it not only includes natural motions, but comprises also such as are not natural. Plainly, a system which would exclude all or a part of the latter would be fitter, possess greater appropriateness, than the old.

Nor is the picture simple. Unessential features are included in it. Such are its forces, which in many cases are wholly unnecessary adjuncts, as in the case of the motion of the stars, where the dynamical relations have never been made the subject of actual experience. The remark applies also to molecular forces, and to chemical and to many electrical and magnetic effects.

The author next considers the form which mechanics has assumed in the last few decades, in which the notion of energy has almost entirely superseded the notion of force. This, the second picture of the mechanical principles, has never been portrayed in all its details; but its possibilities have been recognised, and it is extensively employed by all modern teachers. Its chief claim to excellence is the removal of the difficulties encompassing the notion of force. It employs only the mathematical concepts of space and time, and the physical concepts of mass and energy, the last assumed to be constant in quantity and indestructible. Initially only three elements are considered, space, mass, and energy. The element of time is introduced by means of some integral principle, say Hamilton's. This assumed, we require one empirical fundamental law only, which, though not simple in form, and difficult of immediate apprehension, yet enables us to predetermine absolutely the actual course of future mechanical events. No additional fundamental factors are employed. All the rest are deductive consequences, simplifications, or mere auxiliary terms, appropriate, but not necessary. To the latter class in this system belongs the notion of a force which is introduced merely as a definition, affecting not the correctness of the system, but only its fitness. Has this system advantages over the first, and what are they?

First, with respect to its fitness it is more distinct. It reproduces more of the peculiarities of natural motions than the first It comprehends more exhaustively the dynamic relations of rigid connexions which baffled the first system. It is superior also in simplicity, concerning itself less with things of which we know practically nothing. The old system, when confronted with broader physical problems, was constantly obliged to consider atoms and molecules, things very remote from conception and observation. The caprice which reigned in this field was exceedingly painful to thoughtful investigators. If the results were correct, the intermediate steps possessed no demonstrable real significance. The doctrine of energy circumvents these difficulties. It has its starting-point only in experience. Save energy in its few forms, no auxiliary constructions enter. Our predictions are strictly confinable to the known peculiarities of the material systems considered, and it is wholly unnecessary to cover over our knowledge of details with arbitrary and unessential hypotheses. Not only the final results, but all the steps in the deduction of them, may be considered as correct and having meaning. Such are the advantages of the system on this count.

When we come to the correctness and logical admissibility of the second picture matters are a little different. Often mathematically possible applications of the principle lead to physically false results. Still, all doubts that may be advanced on this subject affect only the appropriateness of the system, not its correctness. The real difficulties await us when we consider its logical admissibility. It is incumbent upon us here to assign the simple and immediate experiences by which the presence of a definite store of energy is established. This is assumed in the theory, not proved. Some physicists ascribe to energy the properties and significance of a substance, distributed throughout space. But its conception has, as yet, been put in no satisfactory nor ultimate form. The main difficulty in it is that this substance appears in two totally different shapes as kinetic and as potential energy. Kinetic energy is definable in familiar, intelligible terms. Potential energy needs new determinations, in fact, does not admit of determination, *as a substance*. It may be viewed negatively, which is contrary to all modes of conception of substance. This discussion is significant, and should be read by persons thinking along the lines of the school of Tait. Lastly, it is natural to expect that a fundamental law of mechanics should be simple. This the Hamiltonian principle is not, and no characterisation of this objection as metaphysical is admissible. The requirement of simplicity is not made of nature, but of our mental models of nature. It was these various objections that led Hertz to renounce the second system, which he at one time tried, for that which he afterwards developed and which is ranked and discussed in his introduction as the third. Of this, we are now in a position to see the drift and utility.

Hertz's own system starts from three concepts only, time, space, and mass. No fourth notion, such as force or energy, is admitted, at least as a fundamental conception. With these three notions alone, however, the resultant relations of the fundamental concepts are somewhat complex. Something seems to be wanting, and this is supplied by a hypothesis not here suggested for the first time. What it is, will be evident. When we attempt to understand the motions of bodies and to refer them to simple and lucid rules, taking into account only what we have palpably before our eyes, our attempts fail. The complexity of the events of the world is greater than that complexity which is within the reach of the senses. To come by a complete, detailed, and competent view of the world, we are obliged to imagine behind the things which we see, other *invisible* things, we are compelled to search behind the barriers of the senses for secret, hidden *accomplices*. The unseen factors here signalised were conceived in the first two systems as entities of a special sort, and were reproduced as them in the notions force and energy. But another way is open. We may admit that a hidden something is active here and yet deny that it can be subsumed under any definite category. We are at liberty to assume that the hidden factor is itself nothing but motion and mass, not different from molar motions and masses, but lying without the range of observation. This is the conception, or rather the hypothesis, by which Hertz fills the gap mentioned. In

the pictorial imagination, to the visible masses of the universe are added other masses obeying the same laws, and by the mechanism thus conceived order is introduced into the universe and harmony into the perceiving mind. No other causes are admissible or necessary. Force and energy are now only *effects* of masses and motions of this lesser and more tenuous sort.

Such explanations are termed dynamical explanations. They explain visible effects by invisible effects of the same kind on a reduced, ultra-microscopical scale. Instead of regarding force and energy, those "secret accomplices" of natural events by which the imagination helps us to explain the world, as noumena, things of thought, abstractions merely, made for the purposes of mental reproduction, these invisible imaginary factors are conceived as the effects of the same sort of phenomena as they are invented to explain, only reduced in dimension. At what link in this descending chain of explanation is science to stop? Is it a whit less difficult to explain the motions and masses of very small, invisible particles in their complex effects as impacts, impulses, forces, energy, than it is to explain the same effects in larger, visible bodies? The whole tendency and search, unless it is properly qualified, has the marks of a metaphysical quest, and is unmistakably a departure from Kirchhoff's ideal, which is the direct quantitative expression of the relations of events, *unalloyed by any mental fictions whatsoever*. There is a note of warning on this point in Helmholtz's remark in the Preface. He says, referring to Thomson's and Maxwell's well-known theories of vortex atoms and electro-magnetic media: "Those inquirers were evidently sensible of a higher satisfaction in the theories mentioned than in the simple, very general expression of the facts and the laws given by systems of differential equations in physics. But I must confess that I, for my part, have found the most security in adhering to the last-mentioned mode of presentation, although I should not be disposed to raise objections touching points of principle against physicists so eminent as those mentioned."

Besides, in assuming that the hidden factors are masses in motion, has Hertz himself not "subsumed them under a special category"? The artifice is a natural one, and almost always employed; for we are eye-minded, and the most familiar part of our intellectual mastery of nature is written in the language of vision. But that part is scientifically perhaps not the most important and powerful part. Trigonometry accomplishes more by regarding infinite series as the definitions of sines and cosines than by adhering to the old, but easily visualised geometrical definitions. So it is with the law of evolution and with the principle of the conservation of energy.

Yet the method in question has been employed with the most fruitful consequences by the most eminent modern inquirers. Thermal forces have been explained by the hidden motions of sensible masses; and electro-dynamic forces and forces of elasticity, by similar assumptions. Now, says Hertz, if this hypothesis has gradually put mysterious forces out of mechanics, it has also a function to fulfil in preventing their original entrance into it—a function which accords with the whole methodological drift of modern physics. This is the critical idea from which

he has proceeded in the development of the third picture. And now we may be brief.

First, we have the three independent and fundamental notions of time, space, and mass as simple objects of experience, because we can assign the actual concrete, sensuous facts by which they are determined. In the case of mass, along with sensually perceptible masses, others hidden and sensually inaccessible are introduced. The relations are then combined that control the union of these concrete experiences. Time and space are combined, and the result is kinematics. Mass and time do not enter into combinations. But mass and space are connected by significant and intimate relations. Between the masses of nature we find empirically definite, purely spatial connexions to exist, such that from the beginning until the end of time, and therefore independently of time, certain definite positions and definite changes of position are imposed upon those masses as possible positions, all others being impossible. Further, the connexions thus empirically exhibited relate only to the relative positions of the masses, and they satisfy definite conditions of continuity, which admit of precise mathematical expression. Finally, all three notions are combined, and the result is mechanics in the ordinary, restricted sense, as applied to material systems. Here a single fundamental law holds, the most general expression of their empirical connexion. This law is a joint product of the law of inertia and of Gauss's principle of least constraint. Expressed in ordinary terms, it asserts that, if the connexions of a given, independent material system could be dissolved for a moment, the masses of the system would disperse in rectilinear and uniform motion, but as such dissolution is not possible they persist as near as they possibly can to that conative motion. This is the fundamental and ultimate experiential principle of this system of mechanics. With the help of the hypothesis of hidden masses and law-ruled connexions, all the rest of the contents of mechanics are derived from it by pure deduction. Force enters the system not as something independent and foreign to us, but simply as an ancillary mathematical construction. In its present form, there is nothing mysterious about it. The same remark applies to energy.

The form and terminology of the system are new. What justifications in the way of utility and appropriateness exist for the alteration? They are, first, its simplicity and brevity. In the new form, the mechanics of material systems does not appear as an extension and development of the mechanics of the single point, but the latter appears, as it should appear, simply as a special case. The new method conforms more to actual experience which begins not with the abstraction point, but with tangible, concrete systems. A second but not so essential advantage is that of its mathematical form; it summarises in one theorem both Newton's first law and Gauss's principle of least constraint, eliminating from the first what is superfluous, and from the second what is mystical. Thirdly, it throws much light on Hamilton's method of treating mechanical problems by means of characteristic functions, which has become an important collateral branch of mechanics.

Important, nay, almost sole emphasis, the author lays upon the logical consistency, *the admissibility*, of his system, Whether it is more appropriate, whether it will embrace all future experience, are minor considerations. The prime motive of its being sprang from that other aspect which was so obscured in the common system of presentation. The author is confident that only one objection of a general character imperils it. That objection concerns the nature of the rigid connexions assumed between the masses, and which is indispensable in the system.

With respect to its correctness, it explains correctly very many natural motions and reaches a little beyond the results of assured experience, thus bearing the character of a hypothesis as touching two important points—the limitation of possible connexions and the dynamical explanation of forces.

With respect to appropriateness, its advantages are confined wholly to the formal realm and do not relate to practice. For practical applications the old system will perhaps never be superseded.

As to the mathematical form of the system it, too, departs from tradition. At the outset, it considers systems of points instead of single points. The mathematical treatment resulting from this has a strange physiognomy, but offers in recompense for its novelty the advantages of simplicity, naturalness, and conciseness.

The body of the work is made up of two books. The first is on the *geometry and kinematics* of material systems; the second on the *mechanics* of material systems. In these two books the new system is empirically and mathematically elaborated, and all the traditional matter of mechanics shown to be involved in its logical consequences. T. J. McCormack.

Immanente Philosophie. By *Max Kauffmann*. Leipsic: Wilhelm Engelmann. 1893. Pp. 130.

The author defines the object of his work to be a summary portrayal of reality, a systematic description of the world, having for its chief feature the rigid exclusion of all hypothetic supplements to empirical occurrences. This involves a definition of reality and of empirical occurrences. The investigation of what is reality and what is knowledge was pursued in an earlier treatise of the author entitled *Fundamente der Erkenntnisstheorie und Wissenschaftslehre*. The definition of the concept of cognition there given excluded the possibility of metaphysical knowledge. It was held that under the notion of Knowable only the facts of consciousness fall, and that these were identical with the facts of empirical reality. It was attempted to show that causality, mathematical and logical laws are nothing else than relations of things appurtenant to empirical reality; and by a criticism of ontological proofs it was sought to establish the untenability of ontology, as also to prove that every world outside of the empirical world is, both in constitution and in existence, questionable, and consequently to be repudiated by sound theoretical philosophy. A synopsis of the arguments of the former work is given in the Preface as a foundation for the fabric of the "Immanent Philosophy" reared in the present work. Ac-

cording to its purpose stated above, the Immanent Philosophy has a two-fold task to fulfil: first, it must point out, by an analysis of all the most important abstract concepts, the metaphysical hypotheses concealed in them, so as gradually to reach a material of purely immanent abstract notions unobscured by superfluous metaphysical ingredients; secondly, by the aid of these ideas it must bind together in systematic form all the facts of reality by empirical laws. The "Immanent Philosophy," or the doctrine of the real, is composed thus of an analysis of what is metaphysical, and of a synthesis of what is real; its purpose is simply to point out the relation or connexion between the facts *as found*. "Every correct metaphysical system can be replaced by a different, simpler, and consequently methodically more useful system; but the true immanent system is unique and individual; it can be developed, completed, and brought into organic union with more concrete facts or laws, but cannot be overturned, refuted, or altered: it has, therefore, so far as it is at all arrived at, the peculiarity of being definitive." The present volume is Book I. of the Immanent Philosophy, and it is occupied with the "Analysis of the Metaphysical." It contains five chapters which discuss respectively, Space and Time, the Ego and the External World, Substance and Change, the Development of the Concept of the Individual, and Subject and Object. The critical reader will find much that is suggestive and stimulating in Mr. Kauffmann's little work. Owing to the book having been printed during the author's absence on a trip around the world, a large number of errors has crept into the volume which he is compelled to apologise for and correct by adding an explanation and List of Errata. μκρκ.

PERSONALITY, HUMAN AND DIVINE. Being the Bampton Lectures for the Year 1894. By *J. R. Illingworth. M. A.* New York and London: Macmillan & Co. 1894. Pp. 274. Price, $1.75.

Mr. Illingworth's expositions make no claim to originality, being simply an attempt to arrange and summarise what has already been expressed with greater amplitude and fuller authority elsewhere. The sources from which he has drawn are chiefly the early Christian Fathers and the modern theological philosophers. The main contention of the author is, "that, whereas physical science "has nowise "weakened, critical philosophy has distinctly strengthened the claim of human per-"sonality, to be a spiritual thing; and, as such, the highest category under which "we can conceive of God." In fact, the ultimate object of the book, in agreement with the conditions of the Bampton Foundation, is "to review our reasons for believing in a personal God." Following from this conception we must suppose a progressive revelation, the evidence for which the author briefly traces, finding its culmination in the Incarnation. As a résumé of arguments in behalf of the old metaphysical conception of personality the book is an excellent one, but it fails to consider, much less to contravene, the researches of modern psychology upon this question. The book would be more valuable if it possessed an index. μ.

PERIODICALS.

THE PSYCHOLOGICAL REVIEW. VOL. II. Nos. 1 and 2.

HERMANN VON HELMHOLTZ AND THE NEW PSYCHOLOGY. By *C. Stumpf*.—THE THEORY OF EMOTION: (II.) THE SIGNIFICANCE OF EMOTIONS. By *John Dewey*.—THE MUSCULAR SENSE AND ITS LOCATION IN THE BRAIN CORTEX. By *M. Allen Starr*.—DISCUSSION: Mind and Body: *Paul Shorey*; Attention as Intensifying Sensation: *H. M. Stanley*; Pleasure-Pain and Emotion: *H. R. Marshall*; A Comment: *E. B. Titchener*.

THE KNOWING OF THINGS TOGETHER. By *William James*.—CONTRIBUTIONS FROM THE PSYCHOLOGICAL LABORATORY OF COLUMBIA COLLEGE (III.): Experiments on Dermal Sensations: *Harold Griffing*; The After-Image Threshold: *S. I. Franz*.—NORMAL DEFECT OF VISION IN THE FOVEA. By *Christine Ladd Franklin*.—PROCEEDINGS OF THE THIRD ANNUAL MEETING OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION, PRINCETON, 1894.—DISCUSSION: The Sensations Are Not the Emotion: *G. M. Stratton*; A Correction: *W. J.* —(New York and London: Macmillan & Co.)

In the January number we have a valuable appreciation of Helmholtz's psychological work by Prof. C. Stumpf, translated from the author's manuscript by J. G. Hibben.

In a preceding article Professor Dewey "endeavored to show that all the so-called expressions of emotion are to be accounted for by reference to movements having some use, either as direct survivals or as disturbances of teleological co-ordinations." In the present paper he proposes to reconsider the James-Lange, or discharge, theory of the nature of emotion from the standpoint there gained. His conclusion is: "Certain movements, formerly useful in themselves, become reduced to tendencies to action, to attitudes. As such they serve, when instinctively aroused into action, as means for realising ends. But so far as there is difficulty in adjusting the organic activity represented by the attitude with that which stands for the idea or end, there is temporary struggle and partial inhibition. This is reported as *Affect*, or emotional seizure. Let the co-ordination be effected in one act, instead of in a successive series of mutually exclusive stimuli, and we have interest. Let such co-ordinations become thoroughly habitual and hereditary, and we have *Gefühlston*.

From an operation made on the brain of a young man suffering from epilepsy, by Dr. McCosh in the Presbyterian Hospital of New York, Professor Starr infers "that the muscular sense centres are distinct in their location from tactile or pain or temperature sense centres; and also from the motor centres; secondly, that they are situated just behind the motor area in the parietal region of the brain."

In the discussions there are a few interesting and lively pages by Prof. Paul Shorey on "Mind and Body." "While we all agree," he says, in deprecating the contamination of psychology with metaphysics, "psychological literature is largely occupied with controversy over metaphysical conceptions introduced by the back door."

Professor James's article, "The Knowing of Things Together," in the March number is the text of his address as President of the American Psychological Association, the last meeting of which was held in Princeton during the last Christmas vacation. The subject of the address is "The Synthetic Unity of Consciousness." He reviews his own and several other attempts to describe accurately and exhaustively this phenomenon, and concludes by abandoning the attempt made in his *Principles of Psychology* to formulate mental states as integers. He admits now, moreover, that metaphysical and epistemological discussions cannot be kept out of psychological treatises.

Abstracts of the papers read before the Psychological Association at the last meeting are published in this number of the *Review*. The *Psychological Index*, comprising the titles of the literature of psychology and cognate subjects in all languages for 1894 (price, 75 cents; to subscribers, 50 cents) is announced by the editors of the *Review*, as is also the founding of a series of *Monograph Supplements* ($4.00 a volume, for 600 pages). One, on *Sensations from Pressure and Impact*, by Dr. H. Griffing, is now ready.

THE PHILOSOPHICAL REVIEW. Vol. IV. No. 1.

Evolution and Development. By *Prof. S. W. Dyde.*—Pleasure and Pain Defined. By *Prof. Sidney E. Mezes.*—The Method of Idealist Ethics. By *Sydney H. Mellone.*—Affective Memory. By *Prof. E. B. Titchener.*—Book Reviews.—(Boston, New York, Chicago: Ginn & Co.)

Professor Dyde distinguishes between evolution and development, evolution being taken to denote a fact of the science of life, and development to indicate the course and character of thought. The article is in the literary style and shows the relations which are influential between the facts of the world and the thoughts that reflect them.

Professor Mezes does not consider all the theories of pleasure and pain, nor has he mentioned the view that pleasure is a feeling accompanying the gratification of a want, and pain the reverse. Following the analogy of the German, he distinguishes two kinds of pain, *Unlust* and *Schmerz*. His conclusions and definitions are: "I. Any psychic fact attended to is pleasant if there is *no* discernible inhibition in the apperceptive system into which it is received. II. Any psychic fact attended to is unpleasant if there *is* discernible inhibition in the apperceptive system into which it is received. III. A pain is an unpleasant sensation, either of touch or systemic, of abnormal intensity."

According to Mr. Mellone's view "we are able to regard the process of Evolution as a gradual emergence, a gradual bringing to light, of what the 'matter and energy' of Nature *really* are; and we explain what Nature (or, what Evolution is) by looking, not to its beginning, but to its End." Physical or non-human Nature becomes the manifestation of a deeper cosmic process, which has a vital relation to human ideal aims of Truth, Goodness, Beauty.

Professor Titchener had maintained "the thesis that the affection, as such, pleasure-pain *qua* elemental process, could never be the object of attention." His present article is a criticism of Ribot's recent assertion that in certain individuals a

truly affective memory is verifiable. He finds that "the affective element, pleasantness-unpleasantness, exists alongside of the sensational and conative factors as a primitive functional constituent of mind; and is not reducible to either of the others. It is impossible to attend to pleasantness-unpleasantness as such. It is therefore impossible to voluntarily recall a past affective state as such. Spontaneous revival of a past affective state as such is also impossible. Even if a pleasantness-unpleasantness were reproduced it could not be recognised."

MIND. NEW SERIES, No. 13.

WHAT DO WE MEAN BY THE INTENSITY OF PSYCHICAL STATES? By *F. H. Bradley*.—ON THE DIFFERENCE OF TIME AND RHYTHM IN MUSIC. By *Dr. R. Wallascheck*.—THE METAPHYSICS OF THE TIME-PROCESS. By *F. C. S. Schiller*.—THE RELATION OF ATTENTION TO MEMORY. By *W. G. Smith*.—SIMPLE REACTIONS. By *E. B. Titchener*.—REALITY AND CAUSATION. By *W. Carlile*.—DISCUSSIONS, ETC.—(London and Edinburgh: Williams & Norgate.)

Although doubtful whether his discussions lead to any definite conclusion, and having a desire only to "reopen the subject," Mr. Bradley believes his inquiries point to five results: "(1) The force of a mental state is a phrase which is most ambiguous. It seldom, if ever, means the same as its actual quantity or area. (2) Psychical strength, taken as an amount of psychical existence or a number of its units, is a conception valid and perhaps useful. Its scale may be relative to my varying condition, but again is average, normal, or absolute. (3) The units of this scale probably cannot be shown, and certainly cannot exist bare; but as an abstraction we seem forced theoretically to assume them. (4) Everything in the soul which in any sense becomes more or less, has *so far* a more or less of psychical existence, but only *so far*. Every 'state' is complex, and the whole state therefore may have a quantity which bears no fixed ratio to any one aspect. (5) Within our psychical content there thus fall scales indefinite in number and more or less independent and able to diverge. Hence a single state may vary quantitatively in various respects, as well as in respect of psychical existence."

The fundamental difference between time and rhythm in music Dr. Wallascheck finds to consist in the fact that rhythm is the form of objective movement, time-sense [that is, the sense of musical time, the French *mesure*, and the German *Takt*] is the form of the perceiving subjective mind. Music, according to Dr. Wallascheck, is essentially a social function; "a musical ensemble, an orchestra, a chorus, is one organism, one person, just as the state represents (juridically) one person, not only a company of several members."

Mr. F. C. S. Schiller is bothered with the question how "that full reality, the individual in the time-process," is to be explained. Scientific knowledge, he thinks, is not an unanalysable term in the explanation of things. Science abstracts from the particularity of reality, in obedience to certain practical aims which it must fulfil. To the discipline in which those aims are formed into a connected and coherent system we must look for an ultimate account of the world. This discipline is abstract metaphysics. It is Mr. Schiller's belief "that a metaphysic of the time-process will stand in the same relation to the explanation of phenomena by their *history* as a metaphysic of abstract ideas stands to their explanation by universal laws."

Mr. Smith's discussion of "the relation of attention to our power of associating and recollecting objects presented to consciousness" is based upon experiments made in Leipsic in 1893 and continued afterwards in Oxford. His results differ

slightly from the conclusions of previous investigators, and he finds that one great drawback to the researches of Ebbinghaus, Mueller, and Schumann on memory is the formulation of the work of memory in terms of time only, leaving the qualitative analysis of memory to be still sought. His own experiments show what visual, auditory, motor, and other elements enter into play.

THE NEW WORLD. Vol. III, No. 12. Vol. IV, No. 13.

SOME QUESTIONS IN RELIGION NOW PRESSING. By *David N. Beach.*—A UNITARIAN'S GOSPEL. By *Charles E. St. John.*—ATHANASIANISM. By *Levi L. Paine.*—SCIENCE A NATURAL ALLY OF RELIGION. By *E. Benjamin Andrews.*—"ONE LORD, AND HIS NAME ONE. By *Samuel R. Calthrop.*—THE GOSPEL ACCORDING TO PETER. By *J. Armitage Robinson.*—JOHN ADDINGTON SYMONDS. By *Frank Sewall.*—MODERN JESUITISM. By *Charles C. Starbuck.*—THE MIMICRY OF HEREDITY. By *George Batchelor.*

THE DEVIL. By *Charles Carroll Everett.*—RACE-PREJUDICE. By *Maurice Bloomfield.*—OLIVER WENDELL HOLMES. By *T. T. Munger.*—THE GOD OF ZOROASTER. By *L. H. Mills.*—THE TRUTH OF THE CHRISTIAN RELIGION. By *Allan Menzies.*—THE PREACHING OF PHILLIPS BROOKS. By *Henry G. Spaulding.*—SOME OF MR. KIDD'S FALLACIES. By *James M. Whiton.*—THE ORIGINS OF THE RELIGION AND HISTORY OF ISRAEL. By *F. Meinhold.*—THE POET IN AN AGE OF SCIENCE. By *Charles J. Goodwin.*—THE SONG OF THE WELL. By *Karl Rudde.*—BOOK REVIEWS.—(Boston: Houghton, Mifflin & Co.)

There are significant signs of stirring in the orthodox theological world, and it will be invigorating for people who have laid the question of the reconciliation of science and religion to heart, to read from the pen of a Congregational clergyman, David Nelson Beach, the article *Some Questions in Religion Now Pressing*, in the December number of *The New World*. Mr. Beach asks: "Has not the time come for a definite reconstruction of theology along the lines in harmony with the largest knowledge and the sturdiest faith of the age? The theology under whose spell the world still rests, that of the age of Anselm and of Aquinas, was conformed to the best contemporaneous science and philosophy. It was of even date. Is ours?"

The article by E. Benjamin Andrews, *Science a Natural Ally to Religion*, tends in the same direction but is written in a slightly different spirit. In any case it is apparent that the opponents of the alliance of science with religion are not all found in the Church proper.

INTERNATIONAL JOURNAL OF ETHICS. Vol. V. No. 2.

THE SIGNIFICANCE OF RECENT LABOR TROUBLES IN AMERICA. By *Hon. Carroll D. Wright.*—THE NECESSITY OF DOGMA. By *J. Ellis McTaggart.*—THE JUVENILE OFFENDER, AND THE CONDITIONS WHICH PRODUCE HIM. By *Rev. W. D. Morrison.*—THE TELEOLOGY OF VIRTUE. By *Walter Smith.*—THE ALTRUISTIC IMPULSE IN MAN AND ANIMALS. By *T. Gavanescul.*—MATTHEW ARNOLD'S POETRY FROM AN ETHICAL STANDPOINT. By *Abraham Flexner.*—DISCUSSIONS.—BOOK REVIEWS.—(Philadelphia: International Journal of Ethics, 1305 Arch Street.)

In the late labor troubles, Carroll Wright says. "the losses have been great, the demoralisation certain, the bitterness intensified, and yet out of it all the great moral lesson comes that there must be found a way to deal with such affairs with-

out the presence of the sheriff and all that the sheriff stands for" (pp 144–145). "The most significant results will be the application, through various offices, voluntary and statutory, of the principles of conciliation and arbitration" (p. 146).

J. Ellis McTaggart's fundamental idea on the indispensableness of dogma is unquestionably correct; but we prefer to call "doctrine" what he calls dogma, reserving the name "dogma" for such axiomatic doctrines as lay claim to be above investigation and criticism. (As to the distinction we make between dogma and doctrine, see *The Religion of Science*, p. 10.)

REVUE PHILOSOPHIQUE. Vol. XX. No. 1 and 2.

La vision mentale. (First Article.) By *J. Soury*.—Psychologie du musicien. (III.) De l'intelligence musicale et de ses conditions subjectives. By *L. Dauriac*.—Morale et déterminisme. By *Schinz*.

L'enseignement philosophique et l'agrégation de philosophie. By *E. Durkheim*.—Criminalité et santé sociale. By *G. Tarde*.—La vision mentale. (Concluded.) By *J. Soury*.—Analyses et comptes rendus, etc. —(Paris: Felix Alcan.)

In the articles on "Mental Vision" M. Soury recapitulates the results of the most recent research in the anatomy, physiology, histology, and neurology of the organs of visions and visual perception as they bear on psychology. The reader will find succinctly summarised here the facts which have recently revolutionised this department of inquiry. The article in the February number by M. Durkheim on "Philosophical Instruction in France" is both interesting and opportune.

REVUE DE MÉTAPHYSIQUE ET DE MORALE. Vol. III. No. 1.

De l'orientation de la méthode en évolutionnisme. By *A. Sabatier*.—Remarques sur le problème de l'instinct. By *Louis Weber*.—Troisième dialogue philosophique entre eudoxe et ariste. By *Criton*.—Discussions.—(Paris: Librairie Hachette et Cie.)

With the January number the *Revue* begins its third year, and we have in this number a brief editorial retrospect or confession of what the *Revue* has achieved in the brief period of its existence. Although much space has been accorded to the logic of the sciences, and to metaphysical philosophy, and the discussions of these branches have been very fruitful, scarcely anything has been done in the department of morals, if we except one remarkable study on Utilitarianism; in fact, very few articles on the subject have been handed in to the editor. The circumstance is significant, and the editor seizes the occasion to make some remarks on the practical bearings of philosophy and to emphasise the pressing necessity of its application to the solution of the problem of real life. His criticisms touch primarily the conditions in France, and it is promised that the future numbers of the *Revue* will devote more attention to this subject. Accordingly, under the title of "Reflexions of a Philosopher on the Questions of the Day," A. Darlu begins the work with a discussion of the *Impôt progressif sur les successions*. If one looks over the contents of the *Revue* for the past two years it will certainly be granted that the first part of its task, that relating to the logic of the sciences, has been very successfully fulfilled In the present number M. Sabatier contends that the scientific method always remains the same as a method, as an intellectual process, but that the angle under which facts are viewed, the importance and the character attached to them are con-

stantly changing. This is what he means by the "orientation of method." His views have a conservative tinge.

M. Weber discusses Instinct in Some of its Metaphysical Aspects, and finds it, naturally enough, in all the manifestations of the mental life. The advantages of dialogue for philosophical exposition,—an instrument now fallen almost entirely into disuse,—are well shown in "Crito's" colloquies.

Dr. G. Frege continues the discussion of the Philosophical Foundations of Mathematics, and we have besides a detailed criticism of some new works on Spinoza by Ch. Andler.

L'ANNEE PSYCHOLOGIQUE.

This is the title of a new psychological year-book to be edited by Prof. H. Beaunis of Nancy, and Dr. A. Binet, director of the psychological laboratory at the Sorbonne, Paris, and having as collaborators Messrs. Ribot, Flourney, Delabarre, Weeks, Victor Henri, Philippe, Courtier, and Bourdon. The *Annual*, which is announced for March and has by this time appeared, is to consist of four parts. The first contains detailed analyses of the various important psychological works which have appeared in 1894 with diagrams, figures, and tables, and so made as to dispense with references to the sources. The main questions treated under this head in the first number are: The nervous system (as recently investigated by Cajal, de Viallet, de Mosso, and others), sensations of sight, hearing, touch, smell, and taste, muscular sensations, sensations of vertigo, etc., memory, association of ideas, and paramnesia (the experiments of Münsterberg, Bryan, Kirkpatrick, and others), attention, the sense of time and rhythm (experiments of Bolton and Neumann), psychometry and psychophysics, ratiocination, will, personality, illusions, hallucinations, dreams, colored audition, pleasure, pain, the sentiments, emotions, æsthetics, the psychology of children and pedagogics, and, finally, discussions of new treatises of psychology and philosophical questions. The second part is a bibliographical index, containing over twelve hundred items, of all the works that have appeared in 1894 touching the histology, anatomy, and physiology of the nervous system, mental and nervous pathology, psychology, philosophy, ethics, pedagogy, criminology, and the psychology of children. The third part will be a publication in full of articles constituting the results of the special labors of the psychological laboratory of the Sorbonne. The fourth part relates to psychological observations and experiments and to new psychological instruments. Appended is a necrology. Subscriptions sent direct to M. Binet at the Sorbonne, Paris, are only seven francs; bought from the trade the volume will cost ten francs each.

ARCHIV FÜR SYSTEMATISCHE PHILOSOPHIE. Vol. I. No. 1.

Ueber Metaphysik als Erfahrungswissenschaft. By *E. Zeller*.—Zur Theorie der Beobachtung (I). By *B. Erdmann*.—Ueber eine Beziehung der Selectionslehre zur Erkenntnisstheorie. By *G. Simmel*.—Ueber psychophysische Energie und ihre Factoren. By *K. Lasswitz*.—Grundlinien einer Theorie der Willensbildung (I). By *P. Natorp*.—(Berlin: George Reimer.)

The *Archiv* is the continuation under a new name and with more specialised objects, of the old *Philosophische Monatshefte*. It is still edited by Dr. Paul Natorp, with whom are now associated Wilhelm Dilthey, Benno Erdmann, Christoph Sigwart, Ludwig Stein, and Eduard Zeller. Although appearing only quarterly, in

scope it is far more pretentious than the old magazine. In this first number the list of contributors shows many eminent names. E. Zeller treats on Metaphysics as an Empirical Science. B. Erdmann supplies the first installment of a series of articles on the Theory of Observation. G. Simmel writes on A Relation of the Doctrine of Selection to the Theory of Knowledge. K. Lasswitz writes on Psycho-Physical Energy and its Factors, and P. Natorp gives the fundamental outlines of a Theory for the Formation of Will. A new and important feature of the *Archiv* are the annual reports of the literature of systematic philosophy in all civilised countries, three of which, namely, the reports of Germany, Great Britain, and France, written by R. Eucken, Bernard Bosanquet, and Victor Brochard respectively, appear in this number. The reports are written in the native languages of the authors.

ZEITSCHRIFT FÜR PSYCHOLOGIE UND PHYSIOLOGIE DER SINNESORGANE. Vol. VIII. Nos. 1, 2, 3, 4, and 5.

Ueber die Natur gewisser mit den psychischen Vorgängen verknüpfter Gehirnzustände. By *J. v. Kries.*—Ueber die latente Hypermetropie. By *Cl. Du Bois-Reymond.*—Psychische Arbeit. By *A. Höfler.*

Psychische Arbeit. (Concluded.) By *A. Höfler.*—Experimentelle Untersuchungen über das Gedächtniss. By *Waldemar Lewy.*

Zur Lehre von den Gefühlen, insbesondere den ästhetischen Elementargefühlen. (I.) By *Theodor Lipps.*—Das Lasèguesche Symptomenkomplex. By *S. Landmann.*—Ueber die Anzahl der unterscheidbaren Spektralfarben und Helligkeitsstufen. By *Arthur König.*—Litteraturbericht.—(Hamburg and Leipsic: Leopold Voss.)

Dr. A. Höfler's articles on "Psychical Work" are full of suggestive thoughts. He seeks to follow out the analogies between the various physical conceptions and the similar terms used metaphorically to express psychological states. The laying bare of the essence of these analogies is very important and nearly every psychological discussion tacitly hinges upon them. They are here considered in all their salient aspects.

VIERTELJAHRSSCHRIFT FÜR WISSENSCHAFTLICHE PHILOSOPHIE. Vol. XVIII. No. 4. Vol. XIX. No 1.

Zur buddhistischen Psychologie. By *Ths. Achelis.*—Bemerkungen zum Begriff des Gegenstandes der Psychologie (II). By *R. Avenarius.*—Ueber subjectlose Sätze und das Verhältniss der Grammatik zu Logik und Psychologie (V). By *A. Marty.*

Bemerkungen zum Begriff des Gegenstandes der Psychologie (III). By *R. Avenarius.*—Ueber subjectlose Sätze und das Verhältniss der Grammatik zu Logik und Psychologie. By *A. Marty.*—Von der Erkenntniss des Guten und Bösen. By *A. Spir.*—(Leipsic: O. R. Reisland.)

Mr. Achelis's article is a brief and concise *résumé* of the main features of the Buddhistic psychology, with especial reference to its modern parallelisms in the doctrine of Hume, Mill, Hegel, and others. For example, we learn that the controversy concerning the *I* and the *Not-I* of Fichte is over two thousand years old. The Buddhists place the solution of the world-riddle in the problem of causality, and we have in Nirvana, the author says, a conception concerning whose philosophical import there cannot be the least doubt.

VOL. V. JULY, 1895. NO. 4.

THE MONIST.

THE THEORY OF EVOLUTION AND SOCIAL PROGRESS.[1]

THERE are two great ideas which, more than all others, have revolutionised modern scientific thought. These are (1) correlation and conservation of natural forces, and (2) *evolution.* The effect of the former has been felt mainly in the physical sciences, of the latter in the biological and sociological. We are concerned here only with the latter.

Definition. Evolution may be defined as continuous progressive change, according to certain laws and by means of resident forces, i. e., by natural forces residing in the thing evolving. As thus defined, it is one half of all science, and covers, therefore, nearly one half of the whole domain of modern thought. This may seem a startling assertion. I stop a moment to justify it.

Every system of interrelated parts may be studied from two points of view, and give rise to two departments of science, one of which, and the more complex one, is *evolution.* From the one point of view we study the action and reaction of the correlated parts among themselves only, producing equilibrium, stability, and permanent harmony. From the other point of view we perceive that the point of equilibrium itself is in motion, onward and upward, and we study the laws of this motion. We find that the equilibrium is never perfect, but is continually being disturbed infinitesimally, to be

[1] An address delivered before the Midwinter Congress, Department of Economics and Politics, San Francisco, March, 1894.

again readjusted on a higher plane with more and more complex interrelations. The harmony is never complete, for infinitesimal discords are continually introduced, only to enhance the beauty and complexity of the ever-increasing harmony. It is this latter point of view that constitutes evolution.

Now, the whole cosmos and all its parts, even to the minutest detail, constitutes such an interrelated system. And since science is a study of the cosmos and its parts, all science has two aspects, one of which is evolution. For example:

1. The *animal body* is a complex system of admirably and delicately adjusted parts, each performing its own function, and by action and reaction co-operating with all others for the conservation of the life and happiness of the whole organism. The study of this constitutes the science of *physiology*. But in the growing animal the equilibrium is never perfect. On the contrary, it is continually being infinitesimally disturbed, only to be again readjusted on a higher plane with still more complex interrelations. The centre of equilibrium itself moves steadily onward and upward. The study of this onward and upward movement and of this steadily increasing complexity of interrelations is called *embryology*. It is not only evolution, it is the *type of evolution*.

2. The *solar system* is a wonderfully adjusted system of interrelated parts, which by their action and reaction produce an equilibrium, a stability and order so perfect that it has been likened to musical harmony. The study of this is physical astronomy or celestial *statics*. But the equilibrium and stability is not perfect and eternal. It is not so now, still less has it been so in the distant past. The present beautiful order and harmonious movement was not made out of hand at once, but has been gradually established and steadily increased from a primal condition of chaos to the extreme complexity and beauty of the present time. The study of this gradual increasing complexity has no separate name. It might be called celestial *dynamics*. It is cosmic development. It is *cosmic evolution*.

3. The *earth* may be studied as to its form and the forms of its parts, its seas and lands, mountains and valleys, rivers and lakes,

its currents of air and ocean, and the action and reaction of all these in producing present climates and other physical conditions which make it a fit habitation for man. All this is *physical geography*. Or we may study the earth and all its parts in their life-history; the gradual process of becoming what they are, the changes through which they have passed, the cause of these changes and their laws. This we call physical *geology*. It is terrestrial *evolution*.

4. The organic kingdom may be studied as to its present infinitely diversified forms; the distribution of these now on the surface of the earth, their relation to one another and to their present environment, the whole constituting by action and reaction through struggle for life a comparatively stable equilibrium. For this study we have yet no appropriate name, but it has been called *chorology*. Or we may study the continual change in all of these interrelated parts throughout all geological time; change by continued modification of each, and readjustment of all on a higher plane, with more complex interrelations. This is development of the organic kingdom throughout all geologic time. This is what most would call "*evolution par excellence*."

So much to make clear what we mean by evolution in the most comprehensive sense. Now the application.

5. *So society* may be studied as a complex system of interrelated parts, acting and reacting on one another by mutual dependence and mutual help; perfectly adjusted to produce eternal peace, prosperity, social order, and good government. This is *social statics*. Or we may study it in its onward movement and the laws of that movement. From this point of view we perceive that the equilibrium is never perfect; peace, contentment, and rest is never complete, nor ought to be; for society is ever struggling to reach a higher plane with wider outlook. The equilibrium is continually disturbed a little in order to be readjusted on a higher plane, with more complex interrelation of all its parts. This is social dynamics, social development, social progress. It is *social evolution*.

We see thus the universal scope of the theory of evolution. We see that its recent introduction has really doubled the domain of scientific thought. It has revolutionised our whole view of nature

and our philosophy on nearly all subjects. It has given an almost incredible impulse to all departments to which it has been applied, but especially to the more complex departments of *biology* and *sociology*.

But is the idea of evolution, then, so very recent? Yes, as a *scientific theory*, though not as a vague *philosophic idea*. It is very necessary to make this distinction. I will give, therefore, a very brief sketch of the history of the idea, in order to bring out this distinction.

PHILOSOPHIC IDEA.

Evolution as a vague philosophic idea may be traced back almost to the dawn of thought. It is dimly perceived in the sacred literature of the Hindus. It becomes a little more clear in early Greek philosophy, and still more clear in the philosophy of Lucretius, the Roman. After a mediæval sleep of many centuries it reappears still more clearly in the philosophic speculations of Swedenborg and Kant. I need not add that the speculations of John Wesley on this subject, of which there has been some talk recently, belong to the same category, i. e. philosophic speculation—not scientific theory.

Thus far we find evolution only in the form of philosophic speculation. That is, the evidence was derived from *within*, not from *without*. It was held because in accord with the laws and necessities of rational thought—not because in accord with observed facts of external nature. Now such mere philosophic ideas are ever unproductive of practical results. They are intended for the delectation of thinkers without even a thought of affecting practical life. These daughters of the intellect remain unmarried to *practice*, and therefore barren. They are vestal virgins about the sacred altar of truth forever without offspring.

SEMI-SCIENTIFIC THEORY.

The first attempt at a scientific theory was by Lamarck in 1809. But it was still only *semi*-scientific. It was still conceived in the philosophic rather than the scientific spirit. Its basis of observed facts was slender, and its conception of the causes and laws of evo-

lution very obscure. Therefore, when opposed by Cuvier, the greatest naturalist of that time, it succumbed. It was well so. It was a premature birth. It was not fit to live. It was not in harmony with the environment of the then known facts. As a scientific theory it was rejected and the question seemed closed.

It was again reopened for a brief space of time in 1844 by an anonymous book entitled *Vestiges of a Natural History of Creation.* This book was distinctly an appeal from the decision of the court of science to the higher court of popular intelligence. It was written in popular style with much specious but inconsequent reasoning and misconception of facts. It produced a profound impression on superficial thinkers, but was far less scientific than Lamarck's work. It was again opposed by all the best naturalists of the time, with Agassiz at their head, and was for the time crushed. I believe it was again best so. It was still a premature birth. The time was not yet ripe. It was not yet conceived in the true spirit of inductive science. The question again seemed closed.

TRUE SCIENTIFIC THEORY.

Again the scientific mind was awakened from its sense of security by the appearance in 1859 of Darwin's *Origin of Species.* This time, as we all know, the theory was almost immediately and universally accepted. The reason of this great difference in its reception now, was (1) that now for the first time it came in the form of a true *scientific theory*, based on an immense array of accurately observed facts and cautious reasonings. Darwin was a perfect type of a cautious, inductive reasoner. He had collected and observed facts and pondered on them; he had organised and systematised his thoughts and verified his conclusions, for twenty years in silence before he published. (2) Again, he not only proved organic evolution as a *fact*, but he showed *how* it could and did take place, by bringing forward a potent and intelligible factor, or cause of evolution, viz. *natural selection.* But again (3) and perhaps most important of all, now, for the first time, the scientific mind was fully prepared and waiting. The birth-time was fully come. The intellectual environment was favorable for its continued life.

Few persons, I think, fully appreciate the importance of this condition of the acceptance of truth. Nearly always the difficulty in the way of accepting new truth is the false or even inimical attitude of the mind. Once get the right, i. e. the rational standpoint, with obstacles or misconceptions removed, and truth at once seems almost self-evident. Now, ever since its birth, four hundred to five hundred years previously, science had been advancing, evolutionward. For centuries the scientific mind had been steadily approaching a standpoint from which evolution was a necessary condition of rational thought. The whole mission of science is to establish the universal reign of natural law. This reign of law had been already recognised in every realm of nature except the organic kingdom, and even there everywhere except in the matter of origin of new organic forms. The origin of species seemed the one anomaly in nature, the one exception to the universal reign of law, the one discord in the universal harmony, the one example of unreason in the rational constitution of the cosmos, and the one obstacle in the way of scientific advance. Darwin removed that obstacle out of the way and the triumph of law was complete. For centuries the conviction of universal reign of law had been gathering strength and like a rising tide pressing with ever increasing force against this obstacle. Darwin lifted the gate and the inrushing flood at once covered the whole realm of science.

Thus it has come to pass that now the difficulty is no longer in accepting, but in understanding how any reasonable mind can withhold assent. To those who look with naked eyes, from a rational point of view, the thing seems self-evident, axiomatic, a necessary condition of rational thought. For it is evidently naught else than the *law of causation* applied to forms instead of to phenomena. Let me explain what I mean.

Physical *phenomena* follow one another in unbroken succession, in continuous chain, each coming from a previous one, as its *cause* and giving rise to a subsequent one as its *effect*. This is the *law of causation*. We *all* accept this law; we act upon it every hour of our lives; we could not exist without its implicit acceptance. We therefore say it is a *necessary* law, a condition of rational thought. We

might, however, call it a *law of derivation* of phenomenon from phenomenon. So also forms—*organic forms*—follow one another in unbroken succession, in a continuous chain, each coming by natural generation from a previous one as its cause and giving rise to a subsequent one as its effect. We call this a *law of derivation.* We might call it a law of *causation*, and say, that *it* also is necessary—a condition of rational thought.

Again: physical phenomena often occur, the cause of which we do not know. In the continuous chain of causes we cannot find the *missing link.* But we never dream of doubting there *was* a link, that the phenomenon *had* a natural cause and came by a natural process. Because so to doubt, is to doubt the validity of human reason and the rational constitution of the universe. So also organic forms appear in the biological history of the earth, the preceding cause of which, the progenitors of which, we do not know. In the continuous chain of forms the missing link we cannot find. But we ought not on that account to doubt that there *was* a link, that the form *had* a natural cause and came by a natural process. Because again so to doubt, is to doubt the validity of human reason and the rational constitution of the universe.

I insist, then, that the derivative origin of all things, whether of phenomena or of forms, is certain, and its acceptance a necessary condition of rational thought; that the theory of evolution is naught else than the scientific, i. e. the rational mode of thinking about the origin of things. It is, therefore, certain and applicable to all nature and therefore to human society. If so, its application must give an incredible impulse to the science of sociology, as it has already done to the science of biology.

Now, it has been so applied especially by Spencer and his followers. Its application has indeed given immense impulse to the *study* of sociology; but as yet, we must confess, this increased study has had little effect in the way of *practical results* and especially in guiding social progress. The reason of this, I am convinced, is twofold. First, because of the extreme complexity and difficulty of the subject, and second, because unfortunately the impulse has taken a *wrong direction.* It is this wrong direction that I take up

first, because this is most fundamental. Once the right direction is taken and right methods used, and the difficulties arising from complexity of the subject-matter will slowly yield.

WRONG DIRECTION.

The wrong direction has been the immediate result of the dominance of a materialistic or mechanic philosophy and its application to every realm of nature. Under the guidance of this philosophy the tendency is to identify the social organism with the animal organism, the body politic with the animal body, and, therefore, to identify social progress with organic evolution. Our first endeavor therefore will be to show that there are many *kinds* of evolution under guidance of *different forces*, operating by *different laws* and on *different planes*. I touch these only sufficiently to show that there are such.

KINDS OR GRADES OF EVOLUTION.

These are:

1. *Physical evolution* of the *earth*, the planetary system, and of the cosmos. The science of geology treats of the evolution of the earth. The evolution of the planetary system and of the cosmos is yet little understood. The subject is still in the domain of more or less probable speculation. The *nebular hypothesis* is such a speculation.

2. *Chemical evolution*, i. e., the gradual evolution of matter from elementary or still simpler conditions, through compounds of various degrees of complexity to the most complex of all, viz., protoplasm. This is the domain of chemistry.

3. *Organic or biotic evolution.* This includes evolution of the individual and of the organic kingdom. It may be called evolution *par excellence*, since it is in this domain that investigation is most earnest and advance most rapid.

4. Last of all is *human evolution* or *social progress.*

Now I wish to show that there is a limit to each kind of evolution, beyond which it cannot go, and therefore that evolution continues only by being transferred to another plane and becoming another kind. For example:

1. In chemical evolution, matter by combination and recombination, and therefore by purely *chemical* forces, rose to higher and more complex forms, until it reached protoplasm, an almost inconceivably complex substance, known to be the physical basis of life. In this substance *chemical evolution reached its goal. Evolution could go no farther on that line.* During the inconceivable lapse of time since life began on the earth chemical evolution has never gone any farther. In achieving protoplasm and with it motility and sensibility, i. e. life, it achieved the possibility of another *kind* of evolution by another kind of force—*life*; operating on another and higher plane and by another process, viz., *organisation.* Therefore, evolution completed on the lower plane is transferred and continued on a higher plane as *organic evolution.*

2. In organic evolution we have another kind of evolution carried forward on a new plane under the guidance of a higher form of resident force—*life*—and by a wholly different process—organisation—with different laws and factors. *This form of evolution reached its goal and completion in man,* the highest possible animal. Evolution could go no farther on that plane. But in achieving man it achieved self-conscious reason and thereby the possibility of another kind of evolution on another and higher plane.

3. Therefore, organic evolution having reached its goal in man is immediately transferred to a higher plane and is thereby transformed and becomes *rational evolution* or *social progress.* This, I insist, is on a higher plane under the control of a different and higher force—reason, operating by different laws and factors, which we must seek to understand and to apply.

4. Is there still another and higher plane? The third plane just explained is all that immediately concerns us now. But shall we not carry out our line of thought, at least, as a suggestion? There must be a still higher and final plane, *the end and term of all evolution.* What else can it be but the *divine plane* from which all evolution sprang? Yes, the term and goal of human evolution is the ideal man, i. e., the divine man. Thus nature by evolution through infinite time struggled upwards to reach again the divine plane from which it originated. Can there be any more noble view, can there

be any other *worthy* view of the significance of nature and of evolution than this?

Now chemical evolution, although determined by *chemical* forces, yet is underlaid and conditioned by *physical* forces. Organic evolution, although urged onward by life forces, is underlaid and conditioned by physical and chemical forces, especially the latter. It is as if life-force used chemical forces and processes for its own higher purposes, to do the work of organisation. So, also, social progress is indeed determined and guided by reason, but is underlaid and conditioned by all lower forces and processes, especially by all the factors of organic evolution. It is again as if reason freely used all the factors of organic evolution for its own higher purpose of rational progress.

From what has been said it is at once seen that although there is a close relation between the social organism and the animal organism, the body politic and the animal body, and between organic evolution and social progress; although, as a result of this relation, all the doctrines and methods of biology must be carried over and used in sociology and all the factors of organic evolution in social progress; yet both in the social organism and in social progress there are higher forces at work. It is these higher forces which under the influence of a materialistic philosophy it has become the fashion to ignore. This vitiates all the reasonings of Comte, Spencer, and their followers. They have almost, if not quite, identified social progress with organic evolution. It becomes, therefore, a prime necessity to insist on the differences and even *contrasts* between them.

In order to do this I must at least enumerate the factors of organic evolution. These are (1) *pressure of a changing environment*, modifying function and therefore structure; and these modifications inherited and accumulated through successive generations indefinitely. (2) *Use and disuse of organs* modify their structure, and the change is inherited and accumulated through successive generations indefinitely. These two are the *Lamarckian factors*. (3) *Natural selection*, among divergently varying offspring, of those only which are fittest to survive. (4) *Sexual selection*, among contestant males,

of the strongest or most attractive, thereby increasing strength and beauty in successive generations. These two are the distinctive Darwinian factors, although Darwin admitted the other two also. (5) *Physiological selection*, or the segregation and sexual isolation, of the mutually fertile. This is the factor lately introduced by Romanes.

Now, no doubt, all these factors are carried over into human evolution or social progress, and are operative there; for man is also an animal. But there is another and higher factor introduced right here (for man is also more than an animal), a factor distinctive of social progress, a factor which soon becomes dominant over all others, viz. the *conscious voluntary co-operation of man himself in the work of his own evolution.* It is a conscious voluntary effort to attain a recognised ideal, in the individual and in society.

This new and higher factor was doubtless introduced in the beginning, i. e. at the moment of the origin of man by emergence of humanity out of animality. But at first it was very weak. Doubtless in early stages of his evolution, man, like other animals, was urged on by factors and forces of organic evolution, unknowing and uncaring whither he tended. But more and more as civilisation advanced the distinctively human factor became dominant until now, in the higher races and in the most highly civilised communities, it takes almost entire control of the process. This *free self-determined* evolution, in order to distinguish it from the *unconscious necessary* evolution characteristic of all else, is what we call *progress.* It is evident then, that as there is in man two natures, a rational and an animal, so there must be in society *two kinds of evolution.* The one is *organic evolution*, the other is *social progress.* This latter is only now beginning to be dominant. The former was a necessary preparation, not only in attaining humanity, but in carrying forward human evolution in its early stages until reason is strong enough to take control.

Now, it is evident that when this new and higher factor is introduced or even after it becomes dominant, the lower factors do not disappear, but only become subordinate. They still continue to underlie and condition the activity of the higher factor. This is

in accord with a general law of organic nature. In every system of correlated parts in harmonic relation by mutual dependence and mutual help, the higher stands above and dominates the lower, but the lower underlies and conditions the higher. So in social progress the higher, self-directing, distinctively human factor, takes control of the movement, but the lower organic factors underlie and condition its activity on every side.

Thus it happens that there is a close resemblance, yet an infinite difference, between human progress and organic evolution. The resemblance (arising, of course, from the operation of the organic factors) has been insisted on and even exaggerated into identity by many recent writers. It becomes the more necessary, therefore, to insist on and bring out in strong relief the differences and even contrasts produced by the introduction of the new factor, differences which are usually ignored, or slurred over, or at least minimised, because modern science seems to think that it must ignore the spiritual nature of man, on pain of being thought unscientific. See, then, some of these contrasts.

1. In organic evolution *nature* operates by *necessary* law without the conscious co-operation of the thing evolving. In social progress the spirit of man voluntarily co-operates with nature in the work of his own evolution, and even assumes to take the whole process mainly into its own hands. Now, this new, voluntary factor, consists essentially *in the formation and pursuit of ideals*—the voluntary striving after better things in the individual and in society. *We* indeed form ideals, but our ideals react and form *us*. Organic evolution is by *necessary* law, social progress is by *free* law, i. e. by a law freely followed. Organic evolution is by a *vis a tergo*, a *pushing* upward and forward from below and behind. Social progress, whether in the individual or in the race, is by a *vis a fronte*, a *drawing* upward and forward from above and in front by an aspiration, an attraction toward an ideal. Organic evolution is by a law of *force*; social progress by a law of *love*.

2. In organic evolution the *fittest* are those most in harmony with the physical environment, and therefore they survive. In social progress the fittest are those most *in harmony with the ideal*, i. e.

the ethically best, and often, especially in the early stages of development, when man is mainly under the dominion of the organic factors and the distinctive human factor is still feeble, they do not survive because not in harmony with the social environment. But while the *best individuals* may, indeed, perish, the ideal survives in the race and will eventually triumph.

3. Organic evolution strives only for survival of the fittest. Social progress strives to *make* as many as possible *fit to survive*. In organic evolution the weak, the sick, the helpless, the old, the unfit in any way, perish and ought to perish, because this is the only means of strengthening the *blood* or *physical nature* of the species. In social progress, on the contrary, the weak, the sick, the helpless, the old, the unfit in any way, are sustained and ought to be sustained, because sympathy, pity, love, strengthens the spirit, the moral nature of man, the distinctive human nature. In a word, in organic evolution war is the great element of advance; in rational evolution, peace. But we must remember that in this material world of ours, and during this, our earthly life, the moral nature is conditioned by the physical nature, the distinctive human by the animal. Therefore, in all our attempts to help the weak, we must beware lest we perpetuate weakness by inheritance. This gravest of social problems, viz. how shall we obey the higher, spiritual law of love and mutual help, without weakening the blood of the race by inheritance, and the spirit of the race by removing the necessity of self-help—this problem I believe can and will be solved, by a rational education, physical, mental, and moral. But, I forbear; this is too large a subject to be followed up now.

4. In organic evolution the bodily form and structure must continually change in order to keep in harmony with the ever-changing environment. In other words, organic evolution is by continual change of species, genera, families, etc. There must be a continual succession of new forms, by modification of old forms. In social progress, on the contrary,—and more and more as civilisation advances,—*man* modifies the *environment* so as to bring *it* in harmony with himself and his wants, and, therefore, there is no longer necessity for change of bodily form and structure or the making of new

species of man. Social progress is not by modification of *form*, i. e. new species; but by modification of *spirit*, i. e. new planes of activity, higher *character*. And the spirit is modified, not by the pressure of an *external* physical *environment*, but by the attractive force of an *internal* spiritual *ideal*; not by antagonistic struggle, but by generous co-operative emulation in the pursuit of the highest.

5. The way of evolution toward the highest, i. e. from protozoön to man, and from lowest man to the ideal man, is a very "strait and narrow way and few there be that find it." In the case of organic evolution, it is so strait and so narrow that any divergence therefrom is fatal to upward movement of the diverging form toward the goal man. No living form of animal is to-day on its way manward, or can by any possibility develop into man. "They are all gone out of the way." "There is none going right, no, not one." The organic kingdom developing through all geological time may be likened to a tree whose trunk is deeply buried in the lowest strata, whose great limbs were separated in early geologic times, whose secondary branches diverged in middle geologic times, and whose extreme twiglets, but also its graceful foliage, its beautiful flowers and luscious fruits, are the faunas and floras of the present day. But this tree of evolution is an excurrent stem, continuous through its clustering branches, straight to its terminal shoot—man. Once leave this stem as a branch, and it is easy enough to continue growing in the direction chosen, but *impossible* to get back on to the straight, upward way to the highest. Thus is it in organic evolution. But in distinctive human evolution or social progress, while the same law holds, it does so with a difference. If individual, or race, or society gets off the strait and narrow way to the highest, the divine ideal, it is hard, very hard, to get back. *Hard*, I say, but *not* impossible, because man's voluntary effort is the chief factor in his own evolution. By virtue of self-activity, through the use of reason, and by his co-operation in the work of his own evolution, man alone of all created things is able to rectify an error of direction and return again to the deserted way.

Thus far we have treated this voluntary co-operation in the work of evolution as only a *factor* co-ordinate with other factors, al-

though now becoming dominant. But really it is much more than a factor. It lifts evolution to a new and higher plane. As already shown, we have here a new kind of evolution, an evolution on another plane, and, as it were, in a different world—the spiritual. As *external physical* nature uses many factors to carry forward organic evolution; so the *internal spiritual* nature characteristic of man alone, uses these same factors on a higher plane and in a new way to carry forward human evolution or social progress.

As this is a fundamental point, I stop to illustrate and enforce. The proposition is that the reason of man consciously and voluntarily uses all the factors of organic evolution in a new way, and indeed transforms them for its own higher purposes. Thus, for example, one organic factor, the *environment*, is not allowed to work naturally, but is modified, or even totally changed, so as to affect suitably the human organism. This is the science of hygiene. Again, *use* and *disuse*, another factor of organic evolution, is similarly transformed by reason. The various organs of the body and faculties of the mind are deliberately used in such wise and degree as to produce the greatest efficiency of each part and the greatest strength and beauty of the whole. This is what we call *education*, physical, mental, and moral. So also the selective factors are similarly transformed, and *natural* selection becomes *rational* selection. We all know how successfully this method is applied for the improvement of domestic animals and cultivated plants; why should it not be applied also to the improvement of the race by selection of our mates in marriage; and to the improvement of society by the selection of our rulers, our law-makers, and our teachers? Alas! how little even yet does reason control our selection in these things. How largely are we yet under the control of the law of organic evolution.

But in these latter days some evolutionists (but not Darwin) say that natural selection is the only efficient factor in any kind of evolution, that Lamarckian factors are no factors of evolution, that changes in the organism in the course of the individual life, whether for better or for worse, are not inherited at all, and therefore such improvements in the individuals cannot be carried forward by in-

heritance and accumulated as race-improvement. Now I cannot at all accept this view. I will not stop to argue it, but simply point out some logical consequences when applied to human progress; consequences which, it seems to me, are nothing less than a *reductio ad absurdum* for the view.

All enlightened schemes of physical culture and hygiene, although directed primarily to secure the strength, and health, and happiness of the *present generation*, yet are sustained and ennobled by the conviction that the improvement of the individuals of each generation enter by inheritance into the gradual improvement of the race. All our schemes of education, intellectual and moral, though certainly intended mainly for the improvement of the individuals, are glorified by the hope that the race also is thereby elevated. It is true that these hopes are usually extravagant. It is true that the *whole* of the improvement of one generation is *not* carried over by inheritance to the next. It is true, therefore, that we cannot by education elevate a lower race up to the plane of a higher race in a few generations, or even perhaps in a few centuries. But there *is*, there *must be*, at least a small residuum, be it ever so small, carried forward from each generation to the next, which accumulating from age to age determines the slow evolution of the race. Are all these hopes then vain? They are so, if so-called acquired characters are not inherited. If these evolutionists are right, then character and capacity in each generation starts on the same plane as the last, to do its *own* work, without hope of giving any results to the next—only an eternal tread-mill round. Knowledge may indeed be accumulated in books, but the capacity to acquire it does not increase.

So, then, according to this modern view, we are left wholly to selection for our hopes of race-improvement. But selection cannot be applied by man in social progress in the same way as nature applies it in organic evolution, or as man himself applies it in improvement of domestic animals and in cultivated plants, for his higher nature forbids. For see: If it be true that reason must direct the course of human progress, and if selection of the fittest is the only method which can be used by reason in the work of race-improvement, i. e., if we cannot *make* the fit, but can only *select* the fit already

made to hand by nature, then the pitiless destruction of the weak, the sick, the helpless, the old, must, with Spartan firmness, be voluntarily and deliberately carried out with man, as with plants and animals. Against such a course we instinctively revolt with horror, because in flagrant violation of our spiritual nature.

But the free use by reason of the Lamarckian factors as already shown, is not followed by any such revolting consequences. All our hopes of race-improvement, therefore, are strictly conditioned on the efficacy of these factors, i. e., on the fact that useful changes in the individuals of each generation effected by a rational hygiene and a rational education are to some extent inherited and accumulated in the race.

* * *

Thus far I have tried to show that investigation has taken a wrong direction. This error of direction was almost inevitable. It was the natural revulsion from a previous error in an opposite direction. Until the discovery, thirty or forty years ago, of the correlation of natural forces and the evolution of organic forms—until the derivative origin of man's body became certain, and of man's spirit became probable, it was imagined that man, especially in his higher parts, must be studied wholly apart from nature ; that no light could be thrown on laws of social structure by the study of the animal body, or on social progress by the study of organic evolution. When, therefore, the close relation of man to animals, even in his highest parts, was established, the force of revulsion from previous error immediately carried the scientific mind to the opposite extreme, viz., that of identification of the laws of social structure with those of the animal body, and of social progress with those of organic evolution. It is this opposite error, prevalent even now, that I have attempted thus far to rectify.

But the error of direction being rectified, there still remains the enormous, almost hopeless, difficulties in the way of scientific treatment of the subject. The problem now is, How shall we use scientific method in the improvement of the social organism and in the guidance of social progress? I wish to show some of these difficul-

ties. For this purpose I find it best to present the subject from a somewhat different point of view.

The social organism, in so far as it is *not* the mere passive result of organic evolution by necessary law, may be regarded as a *work of art*. Now *art* is the material embodiment of certain underlying rational principles. Science is the formal statement and discussion of these same principles. Thus art (I speak mainly of useful art) may be regarded as the embodiment or application of science. Therefore, many imagine that science is the mother of art, and, therefore, must precede art. But not so. Science is rather the offspring of art. In nearly all cases art precedes science and is its condition. Levers and pulleys and inclined planes were used before the mechanical principles involved were understood. The arts of pottery, of agriculture, and of healing were practised long before the corresponding sciences existed. Art, then, leads to science, not science to art; but when science is sufficiently advanced she turns again and perfects art. But there is a transition stage, when an imperfect but arrogant science may interfere with the truer results of empiricism and do infinite harm. This is especially true in the more complex departments. In this stage science ought to be strictly subordinate to a wise empiricism. She must whisper suggestions, rather than utter commands. Such is the relation of science to art in agriculture and in medicine to-day. To illustrate: Science is the *daughter* of art,—heavenly daughter of an earthly mother,—but when she is sufficiently grown, she turns again like a good daughter and helps her mother, and even takes control of the household work. But let her beware lest in her childish vanity her unskilful and meddlesome hands do harm instead of good.

Thus, then, there are two kinds of art—empirical art and scientific or rational art. Empirical art precedes science and is its condition; rational art comes after science and is its embodiment. Empirical art is the outcome of the use of the *intuitive* reason, which works without fully understanding itself, and which in its highest forms we call genius. Scientific art is the outcome of the use of the *formal* reason, which analyses and understands the principles on which it works. Empirical art may indeed attain great perfection,

but sooner or later it reaches its limit and either petrifies or decays. Scientific art, because it understands itself, is of necessity indefinitely progressive. All art passes through these two stages, but more slowly in proportion as the principles involved are more complex. Many arts are still in the empirical stage.

Now, the highest, the most complex and difficult of all arts is the art of government, of politics, of social organisation. This art, of course, must have preceded the science of sociology, for it is the necessary condition not only of the science of sociology, but of civilisation itself. This art has thus far perfected itself, wholly by empirical methods. But there is one peculiarity about this art which makes advance by empirical methods irregular and doubtful. In all other arts the material is *foreign* to the artist; in this, artist and material are identified; society *makes* itself. In this regard it is a product of evolution, not a manufactured article. But again, as already shown, this evolution differs from all others in this: all other evolution is by *necessary* law, without the co-operation of the thing evolving; social evolution is mainly determined by the co-operating will of society itself. Thus it is a product both of art and of evolution. If it were the result of pure evolution by *necessary* law, it would be quiet and peaceful; if it were the result of pure art exercised on *passive*, *plastic*, *foreign* material, it would equally be peaceful. But the mingling of these two elements in varying proportions produces eternal conflict. In early stages the conflict is between classes or factions, and is violent; in later stages it is between parties and far less violent. But in all cases it is more or less blind, unreasoning, passionate conflict. But social evolution and the art of government have now reached a point beyond which they cannot go by the use of empirical methods alone. There really seems, in this country at least, to be serious danger of retrogression in politics and in social organisation unless *scientific methods* are introduced, i. e. unless we understand better the scientific principles of sociology and try to apply them to the art of government. But, on the other hand, it is evident from what has already been said, that the application must be made with the greatest caution and modesty, and in strict subordination to a wise empiricism. Science

must be introduced into politics only as suggesting, counselling, modifying, not yet as controlling and directing. Hitherto social art has advanced in a blind, blundering, staggering way, feeling its way in the dark, retrieving its errors, recovering its falls. But now, under the light of science, even though it be yet but dim, it ought to commence to advance more steadily, *seeing* as well as feeling its way.

Such are some of the principles of social progress as viewed from the standpoint of the theory of evolution and some of the difficulties in the way of the application of scientific method in this field. *My* part is to state principles. I leave it to statesmen to apply them.

Joseph Le Conte.

University of California.

MATERIALISM UNTENABLE.

SO LONG as mind and body were considered as two distinct entities which could be dissociated, and having no necessary relation to each other, each could be thought of apart from the other and each was the subject of scientific effort leading to so-called mental science on the one hand and to physical science on the other. Matter was a temporary habitat for mind.

Most of those who dealt with philosophy believed that the science of mind was so much higher in dignity and worth than physical science, that their terminology degraded the latter. Matter was called gross, inanimate, inert. Forces were supposed to be the cause of any physical phenomena. Thus light, heat, electricity, chemical affinity, and vital force were installed as agencies for moving matter thus and thus. Forces enabled matter to act upon other matter at a distance to produce such phenomena as gravitation, magnetism, and so on. Caloric was invented to explain heat-phenomena. It was an imponderable something which matter could absorb and emit. There were several imponderables, all invented to help out the assumption that matter was inert and had no ability in itself to do anything. Whether or not it was the dominating influence of the reigning theology of the time which was accepted by physical philosophers, it is true that the latter with few exceptions accepted it and let go with reluctance every one of these genii which had been summoned to do physical work. After it had been shown by Davy and Count Rumford in the first of this century that heat was a vibratory motion of matter, the fact did not get into text-books on physics for two generations. Once clearly perceived, however, and in that one particular of heat one imponderable was banished

and every atom of matter having any temperature at all was endowed with energy, and was able to do something itself. So far it was able with its endowment of energy to act on other matter. But the heat of a mass of matter showed itself in two ways. First, by imparting it to other bodies when they were in contact with the heated body, that is, by what is called conduction, and second, imparting it to other bodies at a distance without contact and apparently irrespective of distance, by a process called radiation. If the body was heated so it would shine, that is, give out light, the latter was found to exhibit interference phenomena of such a peculiar sort as to necessitate the assumption of wave motion in some medium. It was observed, too, that the velocity of the light was nearly two hundred thousand miles in a second.

When Thomas Young worked out the theory of light as a wave-motion in interstellar ether, he met ridicule and contempt in some quarters and was elsewhere ignored. Years after Foucault's crucial experiment proving that light went slower through water than through air or a vacuum the text-books continued to say "There are two theories of light, the corpuscular and the undulatory."

The phenomena necessitated the assumption of a medium filling space and it was called the luminiferous ether to indicate its function as a conductor of light. The study of spectra and photography led some to the conclusion that there were three different kinds of radiations, which they called heat, light, and actinic or chemical rays, as they were supposed to be capable of producing, heating, lighting, and chemical effects respectively. Further researches proved that the only difference there was between these was one of wave-length, that every wave of every length was capable of heating bodies, that photography was possible with waves of all lengths and lastly that what was called light depended altogether upon the structure of the eye, or, in other words, is a physiological effect and not dependent in any way upon a particular kind of wave. This knowledge has profoundly affected theoretical views about many things. It has banished radiant heat, and light, and actinism as forces, and it has banished them as proper terminology for any physical phenomena. So completely is this so that Pro-

fessor Newcomb has proposed to banish the word light from physical science. There is no such thing, it is but a physiological effect and has no existence at all apart from eyes. The vibratory motions of atoms and molecules of matter which are called heat, set up disturbances in the medium called the ether, and the latter propagates the disturbance as waves with the velocity of one hundred and eighty-six thousand miles in a second. If the vibrations be slow the waves will be long. If they be more rapid the waves will be shorter. What either long or short waves will do depends altogether upon what kind and condition of matter they fall upon. They all originate in matter which is endowed with vibratory energy and in this process the energy is transformed from vibratory in matter to undulatory in the ether. The energy as such is in a new medium and is endowed with new properties.

In like manner electrical phenomena were thought to be indications of a different force of a dual character known as positive and negative. It was attributed to fluids of an imponderable sort that matter could absorb and emit under certain conditions. Since Maxwell's time it has been made evident that electrical phenomena, like heat phenomena, are interactions between common matter and the ether, for waves may be set up in the ether by electrical disturbances in matter, and the waves travel in the ether with the same velocity as those disturbances set up by heat-vibrations.

For this reason light has been called an electro-magnetic phenomenon, for electric waves in the ether have all the characteristics of ordinary waves which can affect the eyes. They can be refracted, reflected, and polarised. Just as any ray of so-called light can be traced back to a vibrating atom or molecule of matter, so may every so-called electric wave be traced back to movements in a mass of matter.

The dual character of the phenomena is apparently due to torsional strain in the ether which may be either right-handed or left-handed. No one now thinks that a fluid of any kind or a force of any kind is needed to account for electrical phenomena.

Magnetism, too, has been traced to molecules. When a current of electricity is made to traverse a coil of wire that surrounds a

piece of iron, the latter becomes a magnet and will attract other pieces of iron. It appears as if it was endowed with a quality it did not possess before the current of electricity went through the coil. As a matter of fact the function of the current is simply to arrange the molecules, not to magnetise them; they are no more magnetic with the current than without it, but when the molecules face all one way their individual magnetic qualities or fields, as they are called, conspire together, act in one direction, and if they be fixed in their positions, the mass becomes what is called a permanent magnet, whereas, when the current is stopped, if the molecules be free to assume new positions, the cohesion pressure twists them out of place, and then their fields neutralise each other by overlapping. The point here is that one has no need to assume any force or fluid outside of matter to account for magnetism, and that an electric current does not endow iron with its magnetic quality; it is inalienable, and the strength of magnetic attraction is the measure of ether pressure.

Chemical affinity has been shown by Dewar and Pictet to be dependent upon temperature absolutely. At low temperatures there is no indication of its existence, so in the absence of heat there is no such thing as chemical activity. As a force that has gone along with the rest.

As to force itself, irrespective of any particular manifestation, its existence has been denied by high authorities. The ninth edition of the *Britannica* has not recognised the necessity for giving it any attention. The word "pressure" may be substituted for it in almost every place where it is used, and that word carries with it no suggestion or implication of some extra-material condition that controls phenomena.

Vital force was dismissed a long time ago, and all biological phenomena are believed to have physical and chemical antecedents only.

Having discharged all forces and fluids and imponderables from service there still remain all the phenomena, but matter has to be credited with qualities it was believed not to possess, and instead of being the inert thing it was assumed to be, it turns out that it is

loaded with energy and capable of doing many things. Every atom has a hold upon every other atom in the universe, and a change in its position or form or aspect changes in some degree the position, form, or aspect of every other one. The change in position we attribute to gravitation, the change in form to heat, and in aspect to electromagnetism.

When we say that a pound of coal has 14,000 heat-units, we mean that when it combines with oxygen to form carbonic acid gas it gives up heat-energy enough to heat seven tons of water one degree, and as each heat-unit is the equivalent of 778 foot pounds, the working energy of the pound of coal is equal to the product of $778 \times 14{,}000 = 10{,}892{,}000$ foot pounds. That means that the pound of coal and the oxygen have energy enough to raise the pound of coal two thousand miles high, and a mass of matter that can do so much, can hardly be called inert, no matter how helpless it looks. Charcoal is safe to handle, so is sulphur and saltpetre; mix them together, one has added no energy to them, but gunpowder is not a thing to be trifled with, because it has energy. The molecules are loaded with it, and they are in unstable equilibrium. Bread and butter may be fed to an engine as well as coal or wood; it is not so efficient as coal pound for pound, and it costs more, but it will serve the same purpose and in the same way, because it is loaded with energy in such shape as to be available for transformation into heat, and this is one of its functions when it is used for food. The science called thermo-chemistry is concerned altogether with the exchanges of energy in the various chemical transformations, and, as before stated, energy is the ability to move matter directly or indirectly. When it produces pressure simply, it is called potential energy; when it produces motion, it is called kinetic energy, but philosophers are persuaded that energy is always kinetic, even when no work is apparently done. This means that the atoms of matter are not passive bodies, but possess energy in other forms than are manifested by temperature and pressures of various sorts, so matter cannot be what it has for so long time been supposed to be, but must be credited with energies and possibilities which the older philosophies denied it to have.

The so-called properties of matter have often been considered as fiat endowments, but many of them, such as hardness, malleability, density, and the like are seen to be qualities of relation. Thus hardness refers to the degree of cohesion that exists between molecules, and the quality of hardness could not be affirmed of an atom. In like manner density means the degree of compactness of molecules. On the other hand, gravity, mass, and elasticity seem to be inherent in every atom and cannot be annihilated by destroying relations. No physical process has been discovered by which an atom can be annihilated or created, and it is commonly thought the atoms of matter are permanent structures with definite dimensions, somewhere in the neighborhood of the one-fifty-millionth of an inch in diameter.

The chemist reckons about seventy different kinds of matter called the elements, each one differing permanently in its inherent qualities from the rest, so it may be identified by its phenomena. Such differences as these different elements exhibit can hardly be imagined to be due to differences in size or shape. One might understand how spheres and cubes and octahedra and other forms could be made of wood, or stone, or brass, and they might be of any size, but the specific density of them all would be the same, and it would not take long to find it out. To assume that the different kinds of atoms were made of as many different kinds of stuff would not help philosophy or science any, and there is no probability in such a supposition. When one feels assured of the existence of the ether and is aware what reaction there is between atomic matter and it, he cannot doubt there must be some intimate relation between them, for the exchange of some kinds of energy is easy while other kinds appear to be unexchangable. Thus there is no evidence that the translatory motion of a mass of matter affects the ether in the slightest degree, or that matter suffers from friction to any appreciable extent, even where a body like a comet moves through it at the rate of four hundred miles a second. The vibratory change of form sets up waves and the energy is absorbed by the ether at once. The ether is said to be frictionless on account of the former fact that translatory motion may be effected without loss of velocity.

That atoms are elastic there is abundant evidence from the spectrum of the elements, for when it is in the gaseous state and has time for vibrations between impacts, each element gives out waves of definite length, indicating definite rates of vibration, the very best evidence of elasticity known. But elasticity phenomena can be duplicated in the easiest manner by the gyroscope and similar machines, which when quiescent present no such quality, but when made to spin show a degree of elasticity in a manner proportionate to the speed of rotation, so if one could for the time assume that an atom was a spinning somewhat he would be able to see in a mechanical way the explanation of its elasticity, and if there were differences of degree in this he would infer there were different rates of rotation.

All have heard of the vortex ring theory of matter. Not every one knows that up to this time it may fairly be said that it is the only theory of matter we have which has any degree of probability at all. The evidences for it are steadily increasing and thus far nothing has appeared to shake confidence in it. This theory assumes that the atoms of matter are vortex rings of ether in the ether. They are permanent structures because they are in a frictionless medium. They possess form, elasticity, polarity, ability to react upon the ether about them, and on the other hand to be acted on by it. They are the embodiment of energy; indeed, abstract their energy and there would no longer be a ring, only free ether with no qualities different from the rest. This view makes an atom a form of energy, a very different thing from an inert thing, indeed the very opposite, and what might be expected of it would depend upon how much ether was in a state of rotation, its rate of rotation and the specific qualities of the ether of which it was composed, all of these are yet unknown, so one cannot deduce atomic phenomena from a knowledge of the ether. Of the latter it is common to speak of it as a continuous or space-filling medium, frictionless, non-molecular, or not made up of discrete parts, homogeneous, or alike in all directions, capable of acting like both a solid and a fluid, of being thrown into a stress, of transmitting vibratory energy at the rate of one hundred and eighty-six thousand miles a second and gravitative energy more than a million times that speed and withal not capable in any

way of affecting any of our senses in a direct way. Some have considered it as possessing elasticity and density, yet it is apparent that such elasticity and density cannot be like those properties as we find them in matter, for if density means compactness of molecules it cannot properly be applied to a substance not made of molecules, and if elasticity means ability to recover form after distortion it cannot be applied to something which has neither form nor the possibility of distortion.

It is common for such as have not paid much attention to physical distinctions to speak of the ether as matter, the assumption being that in some way not pointed out it is finer grained than what we call the elements. This will not do. There is no evidence that the ether has any grainedness at all, neither is there any evidence that it possesses one of the fundamental qualities of the elements, namely gravitation. Experience has led to the statement of the law of gravitation, the first part of which is that every particle of matter in the universe attracts every other particle. If there be evidence of the existence of something else in the universe not subject to such attraction it is evidently improper to call it matter, else the statement should read, *some* particles of matter in the universe, etc. Until there be some evidence of a physical sort as exists in abundance for what we call the elements that the ether possesses gravitative property it cannot be allowed to treat of it and make deductions from the assumption for the sake of any philosophical system.

How different the two are in their constitution and properties is well contrasted by Prof. Karl Pearson in his *Grammar of Science*, page 310, where he remarks, "our sense-impressions of hardness, weight, color, temperature, cohesion, and chemical constitution, may all be described by aid of the motions of a single medium, which itself is conceived to have no hardness, weight, color, temperature, nor indeed elasticity of the ordinary perceptual type." When these characteristics have been emptied out from matter whatever be left the residue is not matter of our experience and ought to be called by another name.

Physical knowledge is doubtless far from complete but it has been pursued far enough to make it clear that matter and ether are

two radically different substances, and more; if there be any approach to truth in the proposition that the elements of ordinary matter are forms of vortical motion of ether in the ether, then it follows that the ether existed prior to the elements, for the latter are made of the former. If the ether be the frictionless medium it is assumed to be, then no physical process with which we are acquainted could possibly be the condition for the formation of a single atom, and this makes it philosophically needful to assume some agency radically different from any physical agency in our experience which could act upon the ether, endow it with energy of a particular sort and make permanent structures. In other words, it makes needful the assumption that matter and ether with such forms of energy as come into our experience are not sufficient to account for the physical universe as we find it, and therefore any scheme of philosophy which builds on these alone is a defective one. Such materialism has no warrant from the vortex ring theory of matter.

Whatever may be the truth as to the constitution of matter this much is certain now, namely, that it is not inert in any such sense as has been assumed, its relation to the ether is not yet mechanically explained and the properties of the ether itself cannot be inferred from the properties of matter. Of the properties of matter itself we are not yet fully conversant. The phenomena developed at low temperatures, at high temperatures, and with alternating electrical currents have been so much of a surprise to scientific men that more than ever they have been made aware that matter is more wonderful and its possibilities greater than ever were supposed by any, and there is no reason to suppose the end is reached in discoveries of this sort. If our knowledge of matter be but partial and of a kind to revolutionise former conceptions of it, and if our knowledge of the ether be still less perfect and of a kind not yet correlated with the knowledge of matter, it would seem to be hazardous for any one to limit the possibilities of either, and it would be well for one who undertakes to do this that he should show to others by some experimental work that his fundamental conceptions of his factors were worthy of some confidence.

TUFTS COLLEGE, MASS. A. E. DOLBEAR.

THE METAPHYSICAL x IN COGNITION.

THE FAUST ATTITUDE IN PHILOSOPHY.

FAUST had studied all the sciences, had taken degrees in the four faculties, and become a famous professor in the university. Yet in the monologue with which Goethe opens his grand drama, he stands before us a self-confessed ignoramus, whose lectures are a mere waste of time, since he does not teach things worth knowing, and whose despair reaches its climax in the proclamation of the dreary doctrine that knowledge is impossible. He says:

"I've studied now Philosophy
And Jurisprudence, Medicine,—
And even, alas! Theology,—
From end to end, with labor keen;
And here, poor fool! with all my lore
I stand, no wiser than before:
I'm Magister—yea, Doctor—hight,
And straight or cross-wise, wrong or right,
These ten years long, with many woes,
I've led my scholars by the nose,—
And see, that nothing can be known!"

Goethe's magnificent drama has exercised upon the minds of all civilised nations an influence scarcely less than that of the Bible; and here we are confronted with a statement of the impossibility of scientific research. But if science is vain, what shall we do? Are we not like miners in search of useful and precious metals, groping our way in the dark labyrinth of excavations underground, with the assistance of the lamp of scientific method? If science after all is but vanity, had we not better extinguish our lamp and abandon ourselves to the mercy of circumstances?

The Faust attitude is apt to exercise a baneful influence upon youthful minds who accustom themselves to finding the acme of wisdom in the conclusion that cognition is an unprofitable sport, knowledge vain, and science the empty conceit of a deluded brain.

Faust's words are often quoted in order to give the prestige of Goethe's authority to the agnostic doctrine; but let us bear in mind that we must explain the words of the passage from its context; they contain the exposition of the dramatic plot, embodying Faust's fundamental error from which all his later mistakes arise. Far from being endorsed by Goethe, they are proposed for refutation, and Mephistopheles, behind Faust's back, triumphantly says:

> "If thou despisest reason and science, which can
> Alone afford the noblest power to man,
> Thou wilt be mine beyond recall."
>
> ["Verachte nur Vernunft und Wissenschaft,
> Der Menschen allerhöchste Kraft,
> Und du bist mein schon ganz gewiss!"]

The surrender of science is the way to perdition.

Faust began his studies from the top, not from the bottom. He began with philosophy, and we may well assume that the philosophy he studied consisted of that metaphysical verbiage which regards knowledge as a comprehension of things-in-themselves. Faust apparently imagines that so long as we do not know what things-in-themselves are, all our knowledge remains purely phenomenal and worthless. No wonder that he is desperate, for as he states himself, he "rummages in empty words."

According to the metaphysical method of philosophising we know of gold that it is yellowish or reddish, that it is heavier than other metals, possessing in its pure state a certain specific weight, that it does not corrode, is ductile or malleable, etc.; but all our chemical knowledge avails us nothing unless we understand what the essence of gold is.[1] Phenomenal knowledge apparently touches

[1] John Locke, one of the soberest philosophers, says: As "it is plain that the word 'gold' stands in the place of a substance, having the real essence of a species of things made by nature," our notion that gold is something fixed, "is a truth

only the surface of existence, and we are told that what we need is metaphysical knowledge; but metaphysical knowledge can be as little obtained as the blue flower of Wonderland in the hopeless quest of which the knights-errant of yore were busily engaged.

The fatal error of metaphysics is the reification or hypostatisation and substantiation of names. Gold is supposed to be an essence which is in possession of many properties. The properties are knowable, but the essence itself remains unknown. The error is obvious enough: the properties of gold are, in truth, qualities; gold is the sum-total of all its qualities, and we know what gold is, as soon as we know all the qualities of gold.

While metaphysicians mystified themselves and others with things-in-themselves and with the idea of metaphysical knowledge, the investigators in the various branches of science, nothing daunted, continued in their search for truth, and it became an established doctrine of the day that science and philosophy were diametrically opposed. The philosopher looked down upon the scientist, whom he ridiculed for imagining himself in possession of a parcel of truth, while in fact his knowledge was a mere illusion. The scientist on the other hand smiled at the ingenuous pride of the philosopher whose grandiloquent phrases were either the vagaries of dreamers or trivial truisms concealed in the garb of pompous declamations. Some scientists tried to keep in contact with metaphysics, but others cut themselves loose from it, and Kirchhoff, in order to avoid the mysticism into which the metaphysical conception of knowledge is liable to involve a thinker, replaced the term "knowledge" by "description," declaring that the object of mechanics is to *describe* with exhaustive thoroughness and the greatest attainable simplicity the motions that take place in nature. Professor Mach, born of the same spirit of modern science, independently of Kirchhoff, spoke of

---

which will always fail us in its particular application, and so is of no real use or certainty. . . . For if we know not the real essence of gold, it is impossible we should know what parcel of matter has that essence, and so whether it be true gold or no." —*An Essay Concerning Human Understanding*, III, vi, 50.

Among the philosophers of the eighteenth century Bishop Berkeley (commonly, and, even by Kant, erroneously regarded as a denier of reality) is the only one who reached the proper conclusion that substance does not exist.

cognition as an imitation or a mental construction of facts—*ein Nachbilden der Thatsachen.*[1]

After science and philosophy had separated, science began to split up into innumerable specialities, and philosophy lost itself more and more in the labyrinthian woods of metaphysics. The consequence was that the need of a reconciliation was strongly felt, and approaches were made from both sides to reach an amicable *status quo*, in order to keep philosophy sound and to preserve the solidarity of all knowledge in the sciences through the establishment of a philosophy of science.

Schopenhauer made an attempt at reconciling metaphysics with the sciences, and he was in many respects very helpful in preparing the way for the positivism of a Philosophy of Science. Nevertheless, he is still a metaphysician and takes his metaphysics seriously, for in the realm of his things-in-themselves nothing is impossible. The "will" is above space and time and can freely choose its own way of acting. Schopenhauer repudiates spiritism, but speaks about spirits, telepathy, clairvoyance, dreams and the dream-organ, the seat of which he believes to have discovered in the sympathetic system (!) in such a way that any medium should be delighted to quote from him. Schopenhauer's reconciliation of metaphysics and science consists in the proposition of a duality of cognition. There is, according to his philosophy, physical knowledge and metaphysical knowledge; the former is accessible to science, but not the latter. Schopenhauer says (*W. a. W. u. V.*, I, pp. 114–117):[2]

"If we turn to the wide province of natural science, which is divided into many fields, we may, in the first place, make a general division of it into two parts. It is either the description of forms, which I call *morphology*, or the explanation of changes, which I call *ætiology*. The first treats of the permanent forms, the second

[1] See Professor Mach's great work, *The Science of Mechanics*, his *Monist* articles, *passim*, and especially his "Address Delivered Before the General Session of the German Association of Naturalists and Physicians, at Vienna, September 24, 1894," published in *The Open Court*, Nos. 376 and 377, and in his *Popular Scientific Lectures*.

[2] The quotations refer to the pages of the German edition. The English translation by Haldane and Kemp is full of errors and cannot be used without constant reference to the original.

of the changing matter, according to the laws of its transition from one form to another. . . .

"If, however, we surrender ourselves to its teaching, we soon become convinced that ætiology cannot afford us the information we chiefly desire, any more than morphology. . . . It determines, according to law, the order in which the phenomena originate in time and space. But it affords us absolutely no information about the inner nature of any one of these phenomena: this is called *Naturkraft* or power of nature, and it lies outside the province of causal explanation. The constant uniformity with which manifestations of nature appear whenever their known conditions are present, is called a *law of nature*. But this law of nature, these conditions, and the real nature of a phenomenon, in a particular place and at a particular time, are all that ætiology knows or even can know. The power of nature itself which manifests itself, the inner nature of the phenomena which appear in accordance with these laws, remains always a secret to it, something entirely strange and unknown in the case of the simplest as well as of the most complex phenomena. For although as yet ætiology has most completely achieved its aim in mechanics, and least completely in physiology, still the force on account of which a stone falls to the ground or one body repels another is, in its inner nature, not less strange and mysterious than that which produces the movements and the growth of an animal. . . . Consequently the most complete ætiological explanation of the whole of nature can never be more than an enumeration of forces which cannot be explained, and a reliable statement of the rule according to which phenomena appear in time and space, succeed, and make way for each other. But the inner nature of the forces remains unexplained, because the law which our explanation follows does not extend so far; it is limited to their appearance and succession. In this respect it may be compared to a section of a piece of marble which shows many veins beside each other, but does not allow us to trace the course of veins from the interior of the marble to its surface. Or, if I may use a humorous but more striking comparison, the philosophical investigator, when confronted with the entire ætiology of nature, must always feel like a man who, without knowing how, has dropped into a company quite unknown to him, each member of which in turn presents another to him as his friend and cousin, and therefore as quite well known, yet the man himself, while at each introduction he expresses himself gratified, has always the question on his lips: 'But how the deuce am I going to get at the whole company?'"

Schopenhauer forgets his own solution of the metaphysical problem. The forces of nature which in their innermost essence appear to us as inaccessible, are nearer to us than we imagine and we know them better and more intimately than anything else, for our own soul is the metaphysical essence of our bodily being and the company of strangers who introduce themselves as their brothers

and cousins are not only akin to one another, but also to our own existence. The gravity of the falling stone, the heat of the sun, electricity, magnetism, and all other energies are the cousins of our own vitality. They are life of our life, and our organism is but a transformation of these supposed strangers. We hold the key to Nature's secrets in our possession, for our own being is an immediate and most direct revelation of her metaphysical interior.

As to the first comparison of scientific knowledge to the inspection of the surface of a piece of marble, we must add here that Schopenhauer retracts his own view in the *Nachlass*, where he says (page 306):

"By the grain of the surface I cognise the whole marble without being obliged to follow the veins into the interior. The cross-section shows the same condition all through."

In another place *W. a. W. u. V.*, II, p. 190, Schopenhauer discusses the same problem of the relation of physics to metaphysics. He says:

"We find *physics* (in the widest sense of the word) also occupied with the explanation of the phenomena in the world. But it lies in the very nature of its explanations themselves that they cannot be sufficient. Physics cannot stand on its own feet, but requires a metaphysics to lean upon, whatever airs it may give itself towards the latter. For it explains the phenomena by something still more unknown than they are themselves; by laws of nature, resting upon forces of nature, to which vitality also belongs. . . .

"The physical explanation in general and as such requires further a *metaphysical* explanation, which affords us the key to all its assumptions, but just on this account it must necessarily follow quite a different path. The first step to this is that one should bring to distinct consciousness and firmly retain the difference of the two, hence the difference between *physics* and *metaphysics*. . . .

"I say, then, everything, and yet nothing, is physically explainable. As for the motion of the struck billiard-ball, so also for the thinking of the brain, a physical explanation must, at least in theory, ultimately be possible, which would make the latter comprehensible in the same sense as is the former. But even the former, which we imagine we understand so perfectly, is at bottom as obscure to us as the latter; for what the inner nature of expansion in space may be—of impenetrability, motility, hardness, elasticity, and gravity—remains, after all physical explanations, a mystery, just as much as thought. But because in the case of thought the inexplicable appears most immediately, a jump was at once made here from physics to metaphysics, and a substance of quite a different kind from all corporeal

substances was hypostatised—a soul was set up in the brain. But if one had not been so dull as only to be capable of being struck by the most remarkable of phenomena, one would have had to explain digestion by a soul in the stomach, vegetation by a soul in the plant, affinity by a soul in the reagents, nay, the falling of a stone by a soul in the stone. For the quality of every unorganised body is just as mysterious as the life in the living body. In the same way, therefore, the physical explanation strikes everywhere upon what is metaphysical, by which the explanation is annulled, i. e., it ceases to be explanation. Strictly speaking, it may be asserted that no natural science really achieves anything more than what is also achieved by botany: the classification of samenesses. A physical system which asserted that its explanations of things were really sufficient, and thus exhausted the nature of the world, would be genuine *naturalism*, represented by Leucippus, Democritus, and Epicurus down to the *Système de la Nature*, and further, to Delamark, Cabanis, and to modern materialists. . . . They endeavor to show that all phenomena, even those of mind, are physical. And they are right; only they do not see that all that is physical is in another aspect also metaphysical. But, without Kant, this is indeed difficult to see, for it presupposes the distinction of the phenomenon from the thing in itself. . . . Such an *absolute system of physics* as is described above, which leaves room for no *metaphysics*, would change the *Natura naturata* into the *Natura naturans*; it would be physics established on the throne of metaphysics. . . .

"Indeed, behind the reproach of atheism, which in itself is absurd and for the most part malicious, there lies, as its inner meaning a truth, which gives it strength; this is the obscure conception of such an absolute system of physics without metaphysics. Such a system would necessarily be destructive of ethics; and while theism has falsely been held to be inseparable from morality, this is really true only of *metaphysics in general*, i. e., of the knowledge that the order of nature is not the only and absolute order of things. Therefore we may set up this as the necessary *Credo* of all just and good men: 'I believe in metaphysics.'"

We learn from these passages the close connexion which obtains between the belief in things-in-themselves and the idea of a metaphysical knowledge, which is said to cast all physical knowledge into the shade. It is strange only that physical knowledge, which is supposed to be a mere illusion, reveals to us new marvels every day, while that boasted metaphysical knowledge in spite of its pretensions, remains either a vainglorious declamation or comes modestly down to the confession of agnosticism that here we are at our wit's end and that metaphysical knowledge is impossible.

Many a scientist is inclined simply to ignore the pretensions of metaphysics, but that will not do; for there is a truth at the bottom

of the idea of things-in-themselves which cannot be neglected, and the declaration that the nature of knowledge of any kind, in matters philosophical or scientific, is a description of facts will not be satisfactory until we understand the full importance of this definition. What we need is first a mutual understanding between philosophers and scientists and then a reconciliation of their points of view. We need a *philosophy of science*, whose duty it is to prune philosophical speculation, to render science conscious of its aim and methods, to correlate the various branches of investigation, and systematise its most important results in the grand outlines of a scientifically sound world-conception.

SCIENTIFIC KNOWLEDGE AND PHILOSOPHICAL KNOWLEDGE. CORRESPONDENCE WITH PROFESSOR JODL.

Three years ago we discussed (in *The Monist*, Vol. II, No. 2) the problem "Are there Things-in-Themselves?" and took the liberty of alluding to Prof. Friedrich Jodl's view of a modernised thing-in-itself. Professor Jodl, well known to our readers by his brilliant contributions to *The Monist*, as a representative thinker of unusual power and a scholar of first rank, (he is the author of a voluminous work, entitled *Die Geschichte der Ethik in der neueren Philosophie*,) does not discard the term thing-in-itself as we do, but retains it on the ground that cognition always leads to some x, as after all the best expression to denote the total mass of the unknown or unknowable, which is infinite and cannot by any finite amount of knowledge be noticeably diminished. In reply to our arguments Professor Jodl wrote as follows in a private letter:

"A formal rejoinder to your criticism you can hardly expect from me, for, despite what you say against my remarks on the "thing-in-itself," I am not sensible of any far-reaching difference between us. I agree perfectly with your definition of reality; reality (*Wirklichkeit*) is effectiveness—relationship; and, therefore, a "thing-in-itself," in the sense of an isolated "thing *by* itself" is a self-contradiction. And one more thing is certain. We can only call a thing real provided it produces effects, not generally only, but upon us. But how you propose, even admitting all this, to eliminate the mooted x from our cognition, I cannot exactly understand, no more than I can accept your definition of cognition. The definitions of Mach and Kirchhoff which you cite, are not philosophical definitions, that is,

epistemological definitions, but propædeutic or didactic definitions, by positive inquirers in special fields. In a philosophical sense I regard them as nothing more nor less than incorrect. It is quite right that we should regard a matter as explained scientifically when it has been shown to be a special case of a process already known; but as philosophers, it is hoped, we shall not deceive ourselves by forgetting that this known phenomenon closely viewed is also something about which we know nothing. We agree to leave it out of account simply because it is relatively near to our imaginations and of common occurrence.

"Take the most general example.

"When Newton saw the law of falling bodies in the central motion of the moon about the earth, the motion of the planets was "explained," and astronomers were able to "describe" that motion in Kirchhoff's sense as precisely as possible, that is, by means of mathematical principles. But what really takes place in gravitation, whether it is a general property of matter, whether it is the effect of mechanical causes—on that point, as you know, people are still, or rather, are *again*, racking their brains. In other words, this so-called "explanation" leads us to a phenomenon which we are unable to trace back to one that is better known, because our powers of representing it fail us, because it is not made up of any ulterior elements for us, and is therefore called an "elementary fact." Now this signifies simply that we cannot penetrate further here; for us this is a *datum*. But shall we make ourselves believe that because we cannot *see* further there actually *is* nothing further here? Gravitation is real. Surely, that means not only that it *produces* effects, but also that it is *effected*. And so it is with all "elementary" facts. Everywhere the lines of the co-ordinate system in which we draw up our picture of the world carry us into realms of obscurity. We can refuse—and that is the meaning of positivism—to fill up this realm of obscurity with vague pictures of fancy and idealistic speculations. But we need not on that account believe that the region of light which we survey is the universe.

"I would willingly discard the name "thing-in-itself" if it was at all suspected that any sort of ineradicable transcendentalism, dualism, or mysticism were ensconced behind it. With such stowaways I will have nothing to do. I am a convinced upholder of the monistic view of the world, and only mean that an honest confession of the limitations of our knowledge injures in no respect the cause of monism."

This was my reply to Professor Jodl:

"Many thanks for your valuable lines. Your exposition in defence of the *x* in the world, it seems to me, hits the point, and here apparently lies the difference between our views, so far as a difference obtains at all, with all agreements on other important points. I regard the acceptance of the Mach and Kirchhoff definition, or rather conception, of cognition in the philosophical domain, as very important for constituting a sound positivism. And why? Because this conception ren-

ders clear the situation; because it overcomes the ignorabimus theory of agnosticism. Knowledge is not a distinct thing in the world. It is a fact which is intercatenated with other facts. It has a cause and serves a purpose. Knowledge develops in organisms for the purpose of their adaptation to surroundings. The purpose of knowledge is found in action. If an organised being strives for something, it constructs through a combination of representations a plan for action. An organised being is in need of such representations, which denote things in such an analogous and corresponding way, that the subjective image and the objective thing remain in a correct relation. Knowledge, therefore, is a portrayal not only in images but also in thought-symbols, for the purpose of regulating action. It is a representative remodelling of things.

"Knowledge is the product of cognition, it consists in the lucidity and correctness of representations. Cognition is that mental process through which we grasp the sameness of several phenomena. When Newton comprised the motion of the moon and the fall of a stone into one common formula, we were put in possession of a comprehension and explanation of these phenomena. They are now plain to us, and we can formulate their actions in exact terms and with mathematical precision, which can practically be applied as a basis for action. So far, good! I do not believe that on this subject there is any difference of opinion; but now you add, that this conception of knowledge and cognition is quite allowable for propædeutic and didactic purposes in the various specialities of science, but in a philosophical sense, it is wrong.

"I agree with you that it is right to concede honestly the limitations of our knowledge. We know comparatively very little of the world which in its infinity surrounds us. The circle of light visible to us is by no means the universe. This consideration, however, lies in another field, and I have never thought of combating this kind of agnosticism, which I call 'the agnosticism of modesty.' I maintain that knowledge consists in a correct representation of things, and *I cannot understand what knowledge could otherwise be.* Suppose we knew everything knowable, our knowledge would be an orderly system of representations; there would be formulas, with the assistance of which we could under all circumstances predetermine the course of events. That the existence of facts is very wonderful cannot be denied; and indeed in the same way the existence of all facts, without any exception, is equally wonderful. The existence of the world, such as it is, a cosmos arranged according to law, remains grand and overwhelming even to him who has through and through understood its harmonious order. If that is your mysticism, I adopt it I have no objection to this mysticism of sentiment. On the contrary; I endorse it. (See *Fundamental Problems*, page 157, and *Homilies of Science*, the chapter on 'The Value of Mysticism,' page 52.) This kind of mysticism is thoroughly in accord with clearness of reasoning and with the strictest precision of sound knowledge.

"Now, if knowledge is not mere representation, not a portrayal of things, not a description for the purpose of regulating our action, pray tell me, what can it be?

If we call this kind of knowledge scientific knowledge, what do you mean by philosophical knowledge? I must confess that I do not know how you can answer this question.

"Schopenhauer says in a similar spirit: 'Physically, to be sure, everything, but metaphysically, nothing is explainable.' But what is a metaphysical explanation?

"The sole answer which I can imagine is, that a metaphysical explanation expects to receive an answer as to why the world exists at all. This question may mean either, 'How did the world originate out of nothing? or 'What is the innermost nature of things by dint of which they exist?' The former question finds its solution in the law of the conservation of matter[1] and energy, the latter is nothing but an inquiry into the most general feature of being.

[The former is the question after the first cause; the latter after the ultimate *raison d'être* of the universe. The ontological problem originates by a confusion of these two questions.]

"My answer would be, that the ontological problem is illegitimate. We apply the law of causation where we should inquire for the ultimate *raison d'être*. Ontological causality, so called, leads to the formulation of problems which are unsolvable, and to questions which are unanswerable.

"Cognition, the method of which consists in comprehending samenesses, ultimately leads to, and naturally ends in, a universal conception, which represents all the features common to all existence—the idea of being in general, of existence, or whatever we may call it. On the other hand, the law of cause and effect has not in the same sense a natural limit. We can go backward into infinity, and must again and again inquire for a cause of the cause. Only by committing the error of treating the law of reasoning after the analogy of the law of cause and effect, we inquire for the *raison d'être* of the ultimate *raison d'être*, and expect to find a still more general law than the universal law. We want a thought-symbol which would subsume the all-comprising thought-symbol of the universal under a still wider generalisation. Figuratively speaking, we ask, after having found the centre of the circle, 'Where is the middle of the centre?'

"As soon as we become conscious of the truth that all knowledge is representation, the ontological problem, so called, disappears and is recognised as an illegitimate problem.

"You say, 'we can refuse to fill up this realm of obscurity with vague pictures of fancy and idealistic speculations,' and you regard this as 'the meaning of positivism.' This, indeed, is the meaning of the French positivism represented by

---

[1] We here include ether under the term "matter." Supposing the chemical elements such as we find them in experience were due to a condensation of ether, the law of the conservation of matter would not be overthrown, at least not in the sense in which it has been held by physicists.

Comte and Littré, to whom unknowable essences have still a real existence; but this realm of obscurity disappears when the sham problem has been recognised as a sham problem. From my standpoint there is not even a need of filling the realm of obscurity which has a fictitious existence, originating through the ontological problem in vague speculations.

"The so-called ontological problem which inquires after the ultimate *raison d'être* of existence as though the universality of being could be the effect of a cause, leads to a dualism. To be sure, your thoughts are thoroughly monistic, but you commit yourself to a dualistic conception when you say 'Gravitation is real: surely that means not only that it produces effects, but also that *it is effected.*' Here I cannot follow you. The gravitating stone produces effects. It is active itself. The stone in its connexion with the universe is doing work, and I do not find myself necessitated to seek for anything metaphysical behind the stone, by which 'it is effected' and in which we must seek the condition of its activity.

"I repeat once more, I fully recognise the immensity, the inexhaustibility, the grandeur, and the wondrousness of the existence of the world in all its details. I only object to recognising (paradoxically speaking) that kind of cognition which never can lead to cognition.

Professor Jodl wrote back:

"I have studied your long letter of February 17th with the deepest interest and with genuine satisfaction. As I had foreseen, it makes plain our essential agreement in a number of important points, and by your exceedingly lucid presentation puts me in a position to clear up the only point in which my view appeared to you dubious.

"You ask me what I understand by 'a knowledge that is not simply imitation and reproduction with a view to regulating conduct.'

"You exclude, as I think, in a very apt manner, the question concerning the ground of existence from the knowable. I would subscribe to all that, word for word. I feel no need whatever of filling out *τὰ μετὰ τὰ φυσικὰ* with pictures of fancy; and an agnosticism and positivism that should only be a golden bridge for mysticism, is in the highest degree repugnant to me. The Comtian formula, *Vivre au grand jour*, has far more importance for me as a theoretical than as a practical principle.

"But what, then, is my objection to your position, you will say. I can tell you that now, simply enough, in the words of people who are much profounder than I, and save, in doing so, paper and postage. I will ask you to take up Locke's *Essay Concerning Human Understanding*. First, in Book 4, Chapter 11, paragraph 8, you will find a full elaboration of that organic teleology which you emphasise. If, afterwards, you will read Chapter 3 of the same work, then Chapter 6, especially from paragraph 5 onwards, comparing with that Book 2, Chapter 23, passim, and Book 3, Chapter 6, paragraph 9, you will have pretty much all that *my* agnosticism signifies; particularly, if you will take the slight additional trouble of turning to Hume's *Inquiry*

Concerning Human Understanding and of reading over, Sections 4 and 5, "Sceptical Doubts Concerning the Operations of the Understanding." It would be impossible for me to state more plainly what I mean than is done there. You will not believe that I could hope, by means of any sort of higher speculation, which would be synonymous with higher folly, to smuggle in through a back door the knowledge there declared by a critical investigation of the nature of reason to be impossible. I accept completely your 'agnosticism of modesty,' but would have the expression understood in its extensive as well as its intensive sense. The philosopher cannot know things differently from what science does; but he must always keep before his mind the critical limitations and value of this knowledge. And in this sense only does the Mach-Kirchhoff definition appear to me insufficient.

"I believe that we now agree perfectly; for I feel sure that you will hold the expositions of Locke and Hume on the nature and limits of knowledge to be irrefutable."

Now we cannot deny that the passages cited by Professor Jodl contain much sound reasoning, and we children of the latter part of the nineteenth century are much indebted to our predecessors of the end of the seventeenth and the beginning of the eighteenth century. But it seems to me that there are several propositions of Locke and Hume to which we must take exception. I, for one, cannot regard their arguments as "irrefutable," and many of their expressions need a restatement. We confine ourselves to the most important points.

LOCKE'S UNKNOWABLE ESSENCE OF THINGS.

Locke says in his *Essay Concerning Human Understanding*:

"The nominal essence bounds the species—not the real essence which we know not.—III, vi, 7–9.

"Nor, indeed, can we rank and sort things, and consequently (which is the end of sorting) denominate them by their real essences because we know them not.—III, vi, 9.

"No proposition can be known to be true where the essense of each species mentioned is not known.—IV, vi, 4.

"This more particularly concerns substances. . . . For, how can we be sure that this or that quality is in gold when we know not what is or is not gold? since in this way of speaking nothing is gold but what partakes of an essence, which we not knowing cannot know where it is or is not, and so cannot be sure that any parcel of matter in the world is or is not in this sense gold; being incurably ignorant whether it has or has not that which makes anything to be called 'gold,' i. e., that real essence of gold whereof we have no idea at all: this being as impossible for us

to know, as it is for a blind man to tell in what flower the color of a pansy is or is not to be found, whilst he has no idea of the color of a pansy at all."—IV, vi, 497.

Strange how firmly Locke clings to his idea of substance, although he is quite conscious of the confusion into which it implicates his reasoning. He says (II, xxiii, 2):

"If any one will examine himself concerning his notion of pure substance in general, he will find he has no other idea of it at all, but only a supposition of he knows not what support of such qualities which are capable of producing simple ideas in us; which qualities are commonly called 'accidents.' If any one should be asked, 'What is the subject wherein color or weight inheres?' he would have nothing to say but, 'The solid extended parts.' And if he were demanded, 'What is it that solidity and extension inhere in?' he would not be in a much better case than the Indian before mentioned, who, saying that the world was supported by a great elephant, was asked, what the elephant rested on? to which his answer was, 'A great tortoise'; but being again pressed to know what gave support to the broad-backed tortoise, replied,—something, he knew not what. And thus here, as in all other cases where we use words without having clear and distinct ideas, we talk like children; who, being questioned what such a thing is which they know not readily give this satisfactory answer,—that it is something; which in truth signifies no more, when so used, either by children or men, but that they know not what; and that the thing they pretend to know and talk of, is what they have no distinct idea of at all, and so are perfectly ignorant of it, and in the dark. The idea, then, we have, to which we give the general name 'substance,' being nothing but the supposed, but unknown, support of those qualities we find existing, which we imagine cannot subsist *sine re substante*, 'without something to support them,' we call that support *substantia*; which, according to the true import of the word, is, in plain English, 'standing under,' or 'upholding.'"

Locke defines body as "an extended, solid substance," and soul as "a substance that thinks." Had not the idea "substance" been better omitted altogether? Instead of peopling all the domains of existence with unknown substances, would it not be enough to say that body is extension and solidity, and a man's soul is his thinking? Locke's philosophy shows already an antimetaphysical trend, so much so that the natural solution of the difficulty that this mythical substance is a redundant and gratuitous invention, seems to suggest itself in many passages, and the Bishop of Worcester actually accused Locke of "almost having discarded substance out of the reasonable part of the world." Anent this accusation, Locke replies

that he does "not know what to plead to," and quotes a string of sentences in which he asserts the existence of substance, the real nature of which is unknown. As to complex ideas, such as *horse* or *stone*, which are collections of several simple ideas, Locke says (II, xxiii, Note B):

"Because we cannot conceive how they should subsist alone, nor one in another, we suppose them existing in and supported by some common subject, which support we denote by the name *substance*; though it be certain we have no clear or distinct idea of that thing we suppose a support."

Locke declares that the uncertainty which hovers as a Damocles sword over knowledge, rendering it all through purely phenomenal, need not alarm nor disturb us, for "the relative certainty is as great as our condition needs." Our "evidence is as great as we can desire, being as certain to us as our pleasure or pain, i. e., happiness or misery, beyond which we have no concernment, either of knowing or being."

The consistent result of Locke's position is a suspension of judgment on almost every question of importance; for instance, the existence of spirits is to Locke a matter of faith (IV, xi, 12); "however true it may be that all the intelligent spirits that God ever created do still exist, yet it can never make a part of our certain knowledge." We have to abandon all attempts at demonstrating their existence and even at investigating the matter.

HUME'S SCEPTICISM.

The chapters cited by Professor Jodl from David Hume (*Enquiry Concerning Human Understanding*, Sec. IV and V) are of great importance, and we advise every lover of philosophy to study them carefully and critically, especially Section IV, which is entitled "Sceptical Doubts Concerning the Operations of the Understanding."[1] This chapter contains in *nuce* the fallacies of both the agnosticism and the metaphysicism of to-day.

Hume's scepticism is in itself a good thing, for he has put his finger on the sore spot of the problem of philosophy; Hume finds

[1] Ed. L. A. Selby-Bigge, M. A., Oxford, 1894, pp. 25–39.

that all our reasoning concerning matter of fact is based upon our notion of causation. Our notion of causation again is based upon experience. But he continues: "What is the foundation of all conclusions from experience?" He adds: "This implies a new question which may be of more difficult solution and explication," and comes finally to the conclusion that as the difficulty is unsurmountable, we can have no other than "a negative answer." He says:

"Thus the observation of human blindness and weakness is the result of all philosophy, and meets us at every turn, in spite of our endeavors to elude or avoid it."

What are Hume's arguments for this most distressing conclusion which, if it were true, would necessarily leave a gap in every scientific world-conception?

Hume maintains that our knowledge of causation "is not in any instance attained by reasonings *a priori*, but arises entirely from experience" (p. 29). He declares:

"The mind can never possibly find the effect in the supposed cause, by the most accurate scrutiny and examination. For the effect is totally different from the cause, and consequently can never be discovered in it."

And the gist of his arguments is summed up in the following statements:

"That all arguments concerning existence are founded on the relation of cause and effect.

"That our knowledge of that relation is derived entirely from experience.

"That all our experimental conclusions proceed upon the supposition that the future will be conformable to the past.

"To endeavor, therefore, the proof of this last supposition by probable arguments, or arguments regarding existence, must be evidently going in a circle, and taking that for granted, which is the very point in question."

Hume sees pretty clearly the ultimate conclusions of his theory which are nothing less than a denial of the authority of reason. He declares in a long footnote on pages 44–45 that the distinction between reason and experience, useful though it may be, is at bottom "erroneous" and "at least superficial."

All our reasoning is based, according to Hume, upon a *petitio principii*. That a certain cause has always produced a special effect

in the past is no reason why the same cause will produce the same effect in the future. Hume says:

"If you insist that the inference is made by a chain of reasoning, I desire you to produce that reasoning. The connexion between these propositions is not intuitive. There is required a medium, which may enable the mind to draw such an inference, if indeed it be drawn by reasoning and argument. What that medium is, I must confess, passes my comprehension; and it is incumbent on those to produce it, who assert that it really exists, and is the origin of all our conclusions concerning matter of fact."

Hume presents his theory with great modesty and at the same time with extraordinary assurance. He says:

"The best expedient to prevent this confusion, is to be modest in our pretensions; and even to discover the difficulty ourselves before it is objected to us. By this means, we may make a kind of merit of our very ignorance."

Hume proposes the question as much for the sake of information, as with an intention of raising difficulties, keeping, as he says, his "mind open to instruction, if any one will vouchsafe to bestow it upon" him; but having endeavored to show that none of the branches of human knowledge can afford an argument that might have escaped him he feels confident that his scepticism is impregnable. He says:

"This negative argument must certainly, in process of time, become altogether convincing, if many penetrating and able philosophers shall turn their enquiries this way and no one be ever able to discover any connecting proposition or intermediate step, which supports the understanding in this conclusion."

In the course of time, many able thinkers have adopted Hume's scepticism and by a kind of common consensus his negative solution has developed into a philosophical dogma which has acted like a bane upon thought and is still blockading the progress of philosophy.

There is one strange thing about Hume which should have made him suspicious of his own proposition. His theory and his practice do not agree, and he feels that his philosophy is sicklied over with the pale cast of thought. He says in his *Treatise of Human Nature*, IV, 2, p. 218:

"This sceptical doubt, both with respect to reason and the senses, is a malady."

To escape the evil effects of scepticism, Hume's advice is as follows:

"As the sceptical doubt arises naturally from a profound and intense reflexion on those subjects, it always increases, the farther we carry our reflexions, whether in opposition or conformity to it. Carelessness and inattention alone can afford us any remedy. For this reason I rely entirely upon them."

With all due deference to the keenness of the great Scotchman we cannot say that a philosophy whose sole remedy for a malady of reason lies in "carelessness and inattention" breathes the spirit of genuine inquiry or can make any claim of being "irrefutable."

Hume proposes not to make any use of his scepticism when dealing with questions of real life. So emphatic is he in the inapplicability, and that means a practical rejection, of his negativism that he says:

"None but a fool or madman will ever pretend to dispute the authority of experience."

Experience, according to Hume's theory, is a chaos of isolated items, which can never acquire authority, but in practice he considers the denial of its authority as madness. What Hume here calls "authority of experience" is nothing but his vigorously repudiated scientific certitude, the method of which, commonly called reason, is gained through a systematisation of experience.

Hume feels the sting of his inconsistency and he explains his position by the following consideration:

"My practice, you say, refutes my doubts. But you mistake the purport of my question. As an agent, I am quite satisfied in the point; but as a philosopher, who has some share of curiosity, I will not say scepticism, I want to learn the foundation of this inference. No reading, no enquiry has yet been able to remove my difficulty, or give me satisfaction in a matter of such importance. Can I do better than propose the difficulty to the public, even though, perhaps, I have small hopes of obtaining a solution? We shall at least, by this means, be sensible of our ignorance, if we do not augment our knowledge."

Considering Hume's arguments I freely grant that all our knowledge is ultimately derived from experience, but my definition of experience differs from the traditional notion. When Hume speaks of experience, he always enumerates a number of isolated cases, and

calls cause and effect "two objects following one another." Kant, in close agreement with Hume's conception, calls experience "the raw material of our sensuous impressions" and carefully excludes from it all purely formal knowledge and rational judgments. Now there is no doubt about it, that formal knowledge, be it geometrical, arithmetical, logical, or purely rational of any kind, cannot be derived from the sense-element of experience, after we have carefully eliminated from experience the quality of form. If, however, we understand by experience the whole effect of events upon sentiency, including both qualities, form and sensibility, we shall see that all the formal sciences including pure reason, our conception of the purely formal (generally misnamed the *a priori*), the notion of causation, arithmetic, geometry, algebra, and logic can very well be derived from experience. It is quite true, as Kant convincingly proves, that the purely formal sciences are ideal; they are ideal constructions built up in our own mind: but the material out of which we have raised these magnificent structures, which are the notions of pure forms in various domains—pure space, progress in time or units of counting, mere thought-relations such as genus and species, etc., etc.,—have been furnished us by experience. Our notions of pure form are abstractions which we have derived by limiting our attention to pure relations and excluding the things among which they obtain.

By regarding experience as a number of isolated sense-impressions without coherence, Hume starts with a wrong idea of causation. Instead of analysing some phenomenon, he makes a synthesis of what he is pleased to call cause and effect, and finds no necessary connexion among them. He should first have investigated the facts and then explained the meaning of the words cause and effect; but he takes their meaning for granted, and since this meaning is nothing but a confused notion of unvariable succession, it is natural that the whole argument of Hume's scepticism is built upon sand.

The law of causation is a purely formal law and it can justly claim the same validity as all mathematical and logical theorems. It is at bottom the same law as the law of the conservation of matter and energy, which simply means that nothing can originate out of

nothing, and that all processes are transformations. The phenomena which we observe are changes, not creations and not annihilations. It is true that cause and effect are radically different but they are not without definite connexions. Cause and effect are not "objects following one another," as Hume says, but interrelated events.

Poison is not a cause, but the act of taking poison; neither is a dead mouse the effect, but the death of the mouse. Every cause is a motion, an act, or an event, which in a given system of conditions through a disturbance of their equilibrium produces other motions, acts, or events, ultimately resulting in some definite change, called the effect.

When we inquire for the reason why the cause takes effect, we want to know the natural law according to which a given agent acts under given conditions. Natural laws formulate in exact terms the qualities of things, and are nothing more nor less than descriptions. The progress of science warrants the assumption of regarding all natural laws as forming one great system in which the more particular laws are applications of the more general laws to peculiar conditions, and all the general laws form various aspects of the universal order of nature which is at bottom the same as the simple truths of the formal sciences, such as $1 + 1 = 2$, or the angles of equilateral triangles are equal, the intrinsic necessity of which can easily be understood.

Hume's conception of causation is so confused that he constantly mixes up the ideas cause and reason, and speaks of "general causes" and "ultimate causes," when he means reasons of reasons, requiring as an answer more general and universal laws.

Our expectation that the future will resemble the past is based upon the idea that every event that happens is due to a change of place. The state of things and their actions may become very different from what they are now, and conditions may arise which will produce unprecedented constellations, so that the same causes will no longer be attended by the same effects. But, whatever may happen, events must always be due to a cause and will be the result of a mere transformation.

The medium which Hume could not find and which as he says

is required to avoid the vicious circle of founding causation upon experience and experience upon causation, is contained in the eliminated portion of experience, which in his days was called the *a priori*, and which we call the purely formal or the relational. The surrounding world, through contact with which experience originates, is not like a bag of peas, a disconnected number of isolated objects; the world, our own subjectivity included, is a system of relations which in their general features (or, as Germans would say, in their *Gesetzmässigkeit*) are universal. We can describe them as what we call the laws of form.

Our ideal systems of purely formal relations can be used for reference in measuring and counting, and thus the purely formal sciences become the tools of investigation, without which science would be impossible. Our methods of investigation, which include counting, measuring, and the notion of causality, have been derived from experience; they are the formal elements of experience reduced to system and making possible a higher kind of experience, science, which is methodical observation, experiment, and a systematic description of experience.

This is no vicious circle, but an evolution from lowly beginnings to a higher condition, and every stone of the structure of the philosophy of science, which sets forth and explains the principles of scientific inquiry, rests upon a safe foundation, the ultimate basis being experience. The medium which, as Hume said, passed his comprehension, is the systematisation of the formal elements of experience in ideal reconstructions for a so-called *a priori* application to future experiences. And we are so sure of the reliability of this medium, that, as Hume himself confesses, "none but a fool or madman will ever pretend to dispute it or reject it as the great guide of human life."

Reason, in our conception, is systematised experience; it is an ideal and methodical reconstruction of the relational element in experience. We agree accordingly with Hume when he declares that there is no reason without experience. But we cannot grant that all reasoning is mere custom, and that therefore pure reason pos-

sesses no authority save that of custom derived from a haphazard accumulation of many experiences.

Hume misunderstands the very nature of reason. Reason is not a collection of many fortuitous observations, but the quintessence of their necessary interrelations extracted from experience. Reason is not one fact among other facts, not a faculty besides other faculties, such as sensation, but a method, and on the reliability of this method the very possibility of science depends. If we could make no other inferences than such as are drawn from disconnected experiences and not from the systematisation of experience which is called reason, all our arguments would indeed be vain, the conjunction of cause and effect would be "arbitrary and casual," and philosophy simply the recognition of the utter hopelessness of scientific aspirations.

Hume concludes his arguments with this remark:

"If I be wrong, I must acknowledge myself to be indeed a very backward scholar."

We deny the logic even of this last proposition. Hume may have been and indeed he unquestionably was a great scholar and a keen philosopher. But the fact that a man is a scholar does not make him infallible. Agassiz was a great scientist, and yet he was mistaken on the most important problem of his science. The most penetrating thinker may err in his solution of the burning question of his day, while less able minds may hit the truth, which is either due to a greater clearness of comprehension, or may sometimes happen because they are less bewildered by the knowledge of too much trivial detail.

We cannot say that Hume's expositions go to the bottom of the problem. He sees the problem but does not contribute to its elucidation. He is seeking its solution, so far as the looseness of his terms allows him to do so, but has a peculiar instinct of avoiding a discussion of those things which would have afforded him the best assistance in solving the problem.

Hume's errors have become so popular that they permeate even to-day our whole intellectual atmosphere and exercise a baneful influence upon the minds of many prominent thinkers. How injurious

the effect of this anodyne is may be gathered not only from the popularity which Mr. Spencer's agnosticism enjoys, but also from such cases as the late Professor Romanes's *Thoughts on Religion.* Hume's negativism has produced a stagnancy in the philosophical world which prevents the mass of our best thinkers from understanding the needs of the time and finding the solution of the great religious problem that now agitates the world. The propositions made in these pages are still a voice crying in the wilderness, but the time will come, and is near at hand, when their truth will be recognised in both the churches and the universities. Professional philosophers must bestir themselves lest they be left behind in the general advance of the sciences; and the clergy, when pressed harder and harder by scepticism, will find in the pages of *The Monist* a panoply for the defence of religion—not of their antiquated creeds, but of a regenerated faith which has been purified in the furnace of science.

KANT'S IDENTIFICATION OF THE IDEAL AND THE SUBJECTIVE.

Kant was the first to understand the sweeping importance of Hume's scepticism, and he undertook to answer his arguments. Kant called attention to the fact that while Hume had questioned the necessary relation of cause and effect, there were a number of other notions, not less universal and necessary, such as mathematical theorems, the validity of which Hume has never thought of doubting. All the formal knowledge of the mind, under the name of pure reason, is in the same predicament and should receive the same treatment. But Kant's solution of the difficulty as offered in his *Critique of Pure Reason* is almost as bad as, if not worse than, Hume's negativism, for Kant, after having proved all formal knowledge to be ideal, by a strange confusion of ideality with subjectivity, insisted upon the mere subjectivity of time, space, logic, and all other purely formal conceptions. It is true, he always speaks of ideality, but he means subjectivity and thus renders all objective or scientific philosophy illusory. Hence his proposition that things-in-themselves are unknowable.

Sensations, it is true, considered as pure feelings are subjective,

but their various forms symbolise the things through contact with which they originate, and thus they have reference to objective realities: their meaning is not subjective but objective. We grant that there is a difference between the objective world, which appears to us as material, and the subjective world, which is sensory, but one feature is common to both, viz., the formal or relational. If the formal were, as Kant claims, purely subjective, the theory that knowledge is impossible would be justified, and agnosticism would be firmly established.

Man's comprehension of facts is, as it were, a bridge between the subjectivity of his soul and the objectivity of the world in which he lives. Man's knowledge describes his surroundings as the sailor's chart depicts the seas on which he sails. Sense-images and ideas represent the objects of reality and their relations; and the import and practical usefulness of ideas grows according as they approach the ultimate ideal of cognition, which is the comprehension of all difference as a difference of form according to universal formal laws.

Kant distinguishes two sources of knowledge, sensation and pure reason. Sensation in itself is blind, and pure reason in itself is empty. Sensations are incidental and particular, coming to us singly in a haphazard way and without affording any information concerning a necessary connexion. However, the most striking character of pure reason is the intrinsic necessity and universality of its statements; and Kant maintains that from the beginning or *a priori* it lies ready in the human mind in a state of latency to be roused by sense-experience. Kant argues that, since pure reason with its necessity and universality, including the conceptions of space and time and the categories, is not imported into the thinking subject by sensation, it must be purely subjective or ideal. It is a form of the thinking subject, not of the objective world.

Now, we do not deny the ideality of pure reason. Our space-conception, our time-conception, our numbers, geometry, logic, and the schemata are ideal; they are systems of pure thought and belong to the realm of ideas; they are mental constructions. Indeed, they are *purely* ideal, for mathematical points, geometrical triangles, pure numbers, and logical categories do not, as such, exist in real-

ity. At the same time they are in Kant's sense of the word "transcendental."[1] Yet while they are purely ideal and transcendental they are by no means purely subjective. Kant uses the term ideal in the sense of subjective, but the two terms are by no means identical. Both terms are similar and may sometimes cover the same ground so as to be used as synonyms and to allow a substitution of the one by the other. Nevertheless, they are quite disparate; for instance, the feeling feature of sensations is purely subjective, but it is not ideal.

We define ideal as belonging to, or having reference to, the realm of ideas; subjective as belonging to, or having reference to, the realm of the subject. While the laws of form (including the laws of time and space) are purely ideal constructions, we cannot say that time and space are purely subjective. Form is a quality of objective existence, and all bodies are possessed of definite shapes. Form and matter are inseparably connected, and our first notions of pure forms are abstractions. Time and space, it is true, are, as Kant argues, inseparably connected with the thinking subject, but only in so far as the thinking subject is at the same time an object moving about in the objective world as a body of a definite shape and with definite whereabouts. The ideal constructions of mathematics, arithmetic, and logic, are built of materials quarried from the mines of objective existence, the knowledge of which has been acquired by experience. They convey the most reliable information concerning certain universal and therefore very important features of objects and become thus the tools of cognition. We must have them ready *before* we can begin a systematical investigation of objects, and in this sense alone they are *a priori*.

The necessity and universality of a statement, which are to Kant the most important evidence of subjectivity (or, as he says, "ideal-

---

[1] Kant distinguishes "transcendent" and "transcendental," the former being that which lies beyond the possibility of experience, the latter that which is the condition of experience. The notions of time, space, and any other kind of relation (including causality) are transcendental, but not transcendent. All purely formal ideas are mental tools, for cognition consists in tracing the samenesses or differences of form and science would be impossible without measuring or counting.

ity"), indicate, in our conception, objectivity. The most elementary particle of pure form (if we be permitted to speak of form as if it could exist in parts like a material substance) contains *in nuce* all the conditions of its complex potentialities. Given the progression by steps, and we have the elements from which by various manipulations the whole science of arithmetic with its most involved calculations can be derived. Given the possibility of motion in all directions, and we can by merely remaining consistent build up geometry in all its branches with its wonderful harmony and intrinsic necessity. The same process performed in the same way produces the same result, and this is the key to the perplexing mystery that, by the help of an ideal construction, we gain information about the nature of objects. The comet does not obey the subjective theories of the astronomer's mathematics, but the astronomer's mathematics is a mental construction from purely formal elements which are universal features of objective existence, applicable to all the analogous cases which may take place in any part of the universe. The model which we construct corresponds to the reality, so that the former affords information concerning the latter. Our purely formal systems are ideal, but they describe features of objective reality. They are transcendental (i. e. indispensable conditions of experience) only because they describe objective features.

The formulations of the formal laws, as we have them in mathematics, logic, and other formal sciences are, it is true, purely ideal, they are mental constructions, but the formal laws themselves are for that reason not merely subjective ; they are objective and constitute the most important feature of reality, which is the immanent and all-pervading God whose presence is so intrinsic that we are unable to think any possible kind of existence without it ; and the more clearly this feature of reality is mirrored in a sentient being where it is called reason, the higher that being ranges in the scale of evolution, the more truly it can be said to be an image of God and the more far-reaching will be the sway of its dominion over the forces of nature. In a word, manhood is the incarnation of the formal law in its application to the problems and duties of practical life.

No better evidence can be given in favor of the philosophy of

science than the truth that there are not various reasons different in kind. Neither can reason ever be self-contradictory, but is and must always remain one and the same, unfailing in its consistency and harmonious unity.

The uniqueness of reason does not indicate its latency in the subject as subject, but its latency in existence as existence. There is no existence bare of that formal element which by the same actions would not develop always the same result, for it is this sameness alone that constitutes the intrinsic necessity and universality of all formal laws of thought, called reason. This formal feature of existence, which is at the bottom of all natural law by making the same conditions produce the same results, is the source of cosmic order; it is the *Tao* of Lâo-tze, the Amitaba of the Buddhists, the Adrishṭa of the Brahmans, the Christian Logos that was in the beginning and has become flesh in the Son of Man. If anything is supernatural, it alone is worthy of the name, for it is above this real world of ours in so far as it is a condition that applies to any possible world. If there is anything not purely subjective, but objective, universal, and an indelible feature of reality, it is the germ of reason, the intrinsically necessary presence of law in any imaginable kind of existence.

METAPHYSICS MODERNISED. PROFESSOR DEUSSEN'S PHILOSOPHY.

The latest history of philosophy, which comes from the scholarly pen of Prof. Paul Deussen, is in every respect abreast of the times, except in the one point which is so deeply ingrained in the school-philosophy of to-day: it still clings to the metaphysicism of philosophy. Professor Deussen defines philosophy as being in the main "the search after the thing-in-itself." He declares that it is peculiar to philosophy to regard the object of its inquiry, which comprises the totality of all existence, as "something that *needs a further explanation*," treating it as "a problem that points *beyond itself*." He says: "While all other sciences are physical, philosophy is metaphysical." Although he denies that philosophy goes beyond experience in a transcendent way, he yet insists that "philosophy

penetrates experience in order to seize its kernel, while all physical science remains engaged with its shell. Thus all philosophy is ultimately metaphysics."

The distinction between the metaphysical kernel and the physical shell of nature was the basis of Haller's agnosticism, which Goethe so emphatically rejected by saying:

> "Natur hat weder Kern noch Schale
> Alles ist sie mit einem Male."

There is no harm in using allegorical expressions, such as kernel and shell, but there is a danger in building upon them philosophical theories. Nor is there any objection to the term "metaphysical," provided it be clearly defined, and all misconstruction, as though it meant something that points beyond experience, or leads behind nature, be excluded.

Prof. Deussen has also written a text-book on *The Elements of Metaphysics*, which is of interest as an elaboration of a metaphysical philosophy, which, so far as historical and philological scholarship are concerned, is thoroughly up to date. The very first page, however, shows the lack of a truly scientific spirit, so much needed in philosophy. Professor Deussen begins dogmatically with the proposition that two standpoints are possible, the empirical and the transcendental. The former, inquiring into phenomena, is "physics" in the widest sense of the word; the latter, inquiring after the thing-in-itself, is "metaphysics." In paragraphs 7 and 8 we are told that time and space are infinite. In paragraphs 8 and 10 he says: "Everything that exists necessarily exists in space, for otherwise it would be nowhere, and accordingly would not exist at all." The same argument is repeated in paragraph 10: "Everything that happens necessarily happens in time, for otherwise it would happen never, and accordingly it would not happen at all." This start is characteristic of a metaphysical philosophy.

A positive philosophy begins with a statement of facts. Facts are our data which have to be explained, but it is not easy to determine what "facts" in this sense means. The facts from which we have to start are the experiences commonly called sense-perceptions;

and upon a further inquiry, we discover that they are the elements which in the long process of evolution have built up our soul.

As to time and space, the positive philosopher does not predict their infinity, but inquires into the nature and origin of these notions. We find that both are the product of abstraction, and would say that an idea from which the notion of space is excluded represents something whose nature is independent of space. Thus there are indeed many things which exist without being either in time or space. The existence of non-spatial realities is an old *crux* in philosophy, as we know from *The Questions of King Milanda*, where Nagasema maintains and proves the positive existence of Nirvâna, although Nirvâna is neither in time nor in space. The unbeliever is refuted by a *reductio ad absurdum* and Nagasema proves that according to the logic of his adversary wisdom is a non-entity, for it is nowhere.

Space is not (as Kant has pointed out) a mysterious entity. It is not a thing-in-itself, not a metaphysical box in which existence is contained. But it is a feature of existence. Space is extension, and extension is a quality of the objective world. As extension, space represents the interrelation of things, including, if they are in motion, also all possible interrelations, viz., direction and all possible change of direction, or, in a word, the possibility of motion.

The infinity of space would be mysterious, if it were a box in which the world is contained; but it ceases to be mysterious as soon as we understand that it is the possibility of motion which in every direction is unlimited.

Time, in the same way, is not an incomprehensible monster which swallows the things that are now, and, at the same time, begets the things that will be. Time is as little a thing-in-itself as space. Time is not that which contains all the events that take place, but it is an abstract idea derived from the facts of our experience. Time is nothing but the purely formal aspect of change, considering the succession and duration of events. Time is the measure of duration, which is accomplished through the establishment of a unit of duration.

Professor Deussen assumes metaphysics in the very beginning

of his philosophy. No wonder that after a critical examination of the material under his hands he finds throughout a metaphysical residuum, casting a glamor of mysticism over his whole world-conception, which may be characterised as a modernised edition of Schopenhauer's philosophy.

PHILOSOPHY DEFINED.

But what becomes of philosophy if metaphysics is gone? Is philosophy merely (as it was to Auguste Comte) the sum-total of scientific knowledge, or has it still a province of its own?

Philosophy has, indeed, a province of its own, the limits of which are quite well defined. Philosophy is engaged with such inquiries which, according to their nature, are common to all sciences. An investigation into the constituents of water belongs to the domain of a special science called chemistry. But a consideration of the methods of science concerning the comprehension or explanation or systematisation of facts belongs to the department of philosophy. Yet, for that reason, philosophy, as we understand it, is not superscientific, but is a science among the sciences. And there are three great departments in philosophy:

First, philosophy is above all *methodology*. It has to investigate the basis of all the sciences; it has to define and explain the scientific methods which the scientist instinctively employs as tools of scientific inquiry. We need an elucidation of such ideas as causation, natural law, cognition, experience, reason, and truth.

Secondly, philosophy must be *systematology*. From the data furnished by the most matured results of the various sciences philosophy constructs, with the help of the best scientific methods accessible, a world-conception which must be at once consistent and systematic.

And, thirdly, philosophy has to apply the results of this systematised world-conception to practical life. It must be what is generally called *world-wisdom*. Philosophy must teach man his place in nature. It must enable him to strike the proper attitude in life. It must attune our souls to the harmony of the whole of which we

are a part, and advise us as to the right conduct in life. This is ethics in the broadest sense of the word.

Philosophy as here conceived may be called "the philosophy of science," because it recognises the importance of defining philosophy as the science of science, and insists that its methods and modes of operation are in principle not different from the other sciences. Philosophical cognition is essentially the same as scientific cognition.

THE MONISTIC CONCEPTION OUTLINED.

Having gone over the ground of the most important objections that can be made to the proposition of conceiving the nature of knowledge as description, we shall now give a brief *resumé* of the function of cognition in its various stages. It is not our intention to give exhaustive proofs and arguments, but to present the subject in a dogmatic way, so as to make its presentation concise, and to indicate in great outlines the far-reaching importance of this theory.

The world around us appears to our senses as matter moving in space, but the world in us, our soul, consists of feelings or states of awareness which rise from sensations of all kinds to the higher spheres of ideas and abstract thought, arousing in us impulses and volitions of all degrees of intensity and conscious lucidity. Anything perceived in the outside world of matter moving in space is called "object," the inside world of feelings is called "subject," and we observe at once that our own being appears in our own perception as a part of the objective world. We are soul, but we appear to ourselves and to other sentient beings as a body moving about in space.

The channels of our notions concerning the world of objects are our senses, and comparative physiology teaches that they have developed by a gradual adaptation of an undifferentiated sentiency to the various actions by which the skin of organised beings is affected. The various contacts produce various disturbances in sentient matter and each kind of disturbance in the objective body, if strong enough to become conscious, is subjectively felt as an analo-

gous kind of feeling. Here the theory suggests itself that each form of objectivity is endowed with an analogous subjectivity, so that all the bodies of the same or a similar shape with ourselves, acting according to the same or similar principles, are possessed of the same or similar souls. The evidence of this monistic conception is so overwhelming that in practical life all living beings accept the theory unconsciously and endow all bodies which in their actions exhibit purpose with sentient souls according to their various organisations. However, we cannot without falling into inconsistency escape the conclusion that other objective existences too, those which appear inert and which by scientists are classified under the head of inorganic nature, possess their exact subjective equivalent, for the material of the soul-endowed world of organised life is the same as that of the inorganic world, the latter is the inexhaustible reservoir for the sustenance of the former, and we have good reasons to believe that the former spontaneously under still unknown conditions develops from the latter. The lowest kind of subjectivity which must be supposed to be present in the gravitating stone or in the chemical action of the elements is, so far as we can judge, not sentient, but it contains in an unorganised state the elements of sentiency; inorganic nature does not feel, but it is endowed with the potentiality of feeling.

We conceive the world as an immeasurably great system of interactions, and say that every action is subjectively a feeling or an element of feeling and objectively a motion. An idea which I think is subjectively a state of awareness and objectively a brain-motion. The feeling and the motion are two aspects of one and the same fact.

Wherever existence has developed into a sentient organism, every impression which is felt as a peculiar sensation leaves a trace, the form of which is preserved in the flux of organised life; and when another impression of the same kind creates another correspondent sensation, it is transmitted to the memory trace of its predecessor which is thereby revived and is felt to be the same. Thus this feeling naturally comes to indicate the presence of the same object whatever it be and sensations naturally develop into

symbols or signs representing the object of contact and processes that take place in the objective world.

Sensations are the basis of all knowledge; they picture our surroundings in the feelings which the various objects in various ways, according to their nature, rouse by their contact with the sentient organism. Sensations are not the things pictured in them, nor do they inform us of the nature of things-in-themselves, they only represent the things so as to show which is which. Representativeness is the characteristic feature of the soul and it is the root from which cognition grows.

The simplest kind of cognition is perception; it is the picturing of objects in their analogous forms of feeling, so that their sameness or the similarity of a new sensation with former sensations is perceived, or, as we correctly say, re-cognised.

Cognition in its primitive form is a reference of the new sensation to an old one, into whose memory-trace it fits; it is the reduction of the unknown to the known; a subsumption of the unfamiliar under a class of former experiences which are familiar.

Explanation is a more complex kind of description. It is a making plain, so that the changes of a process can be traced in all their details.[1]

Natural science has found it convenient of late to express the causal law as a preservation of matter and energy. The law of the preservation of matter and energy is, closely considered and in spite of its formulation in a positive assertion, a negative statement: it means that matter and energy are neither increased nor diminished; and its positive counter-formula would be: "all change is purely change of form; it is not a change of the innermost nature of reality; or, briefly, causation is transformation." The terms, "matter" and "energy," are abstractions which denote two general qualities, the identity of which can be traced in the various transformations of all phenomena; they represent the universal features of that which is real, not entities, not substances in the

[1] There are two views as to the nature of explanation which we may call the metaphysical and the scientific, or the dualistic and the monistic views. Compare the chapter on Explanation in *The Monist*, Vol. III, No. 4, p. 585 et seq.

sense of independent existences, not things-in-themselves. We have to add that matter in this connexion is intended to mean mass, for the law of the preservation of matter does not preclude the production of matter from ether by condensation, or any other procreation of the material universe from ether, or perhaps even of ether from a more rarified world-substance—in brief, of sense-perceptible reality from what we might call potential reality.

A formulation of two or several phenomena, so as to exhibit their essential identity, showing that their difference is due to a difference of form, resulting according to the forming factors of different conditions conformably to the universal laws of form, is called comprehension; and the most important advantage of comprehension is the simplicity which in this way explanations or systematic descriptions acquire.[1]

PROFESSOR MACH'S ANTI-MECHANICALISM IN PHYSICS.

We have often taken occasion to express our great admiration of Professor Mach, and we have quoted him as one of the best authorities who accept the definition of knowledge as "description," in full consciousness of its sweeping importance, not only for science, but also for philosophy. But there is one point on which we cannot agree with Professor Mach's conception of cognition. He regards the mechanical aspect (the change of form) not as we do, as one of the universal aspects of reality, but as one abstraction of reality among many other abstractions, and he considers it as perfectly equivalent with such notions as electricity or chemical affinity. He regards the reduction of all physical processes to motions as a chimerical ideal, and declares: "It is simply an accident of history that the development of the principle of energy in physics was not connected with the practical applications of electricity." He says in his article "On the Principle of the Conservation of Energy" (*Popular Scientific Lectures*, p. 151):

"Mechanical events as simple motions in space and time best admit of observation and pursuit by the help of our highly organised senses. We reproduce me-

[1] Ernst Mach speaks in this sense of the economy of thought.

chanical processes almost without effort in our imagination. Pressure as a circumstance that produces motion is very familiar to us from daily experience. All changes which the individual personally produces in his environment or humanity brings about by means of the arts in the world, are affected through the instrumentality of *motions*. Almost of necessity, therefore, motion appears to us as the most important physical factor. Moreover, mechanical properties may be discovered in all physical events. The sounding bell trembles, the heated body expands, the electrified body attracts other bodies. Why, therefore, should we not attempt to grasp all events under their mechanical aspect, since that is so easily apprehended and most accessible to observation and measurement? In fact, no objection *is* to be made to the attempt to elucidate the properties of physical events by mechanical *analogies*.

"Granted that we had a perfect knowledge of the mechanical processes of nature, could we and should we, for that reason, *put out of the world* all other processes that we do not understand? On this principle it would be really the simplest course to deny the existence of the whole world."

The fact is that of molar motion we have a visual image, but our ideas concerning electricity and combinations by chemical affinity are mysterious, and their actions remain unintelligible until we can explain them by analogous events in molar mechanics. It is no accident but a matter of necessity that we cannot help trying to understand all phenomena as transformations, or changes of place; and if we are unwilling to consider this state of things as due to the nature of objective existence, we should have to say, such is the constitution of sentient beings, and especially of the thinking subject which has acquired the faculty of reason, that it must explain changes as motions which produce new constellations.

In our opinion the mechanical aspect is a more general feature of reality than electrical and chemical phenomena, all of which belong to the same category of objective nature. The attempts of physicists to understand the latter as a species of the former by considering them as molecular mechanics is no accident, but the necessary outcome of the natural relation that obtains among these abstractions. That class of phenomena to which our sensory organs are, as it were, adapted so as to show them in the focus of our direct observation naturally appear as molar motions and we cannot help thinking that such more subtle changes in nature, as for instance chemical combinations, are of the same character, only on a smaller scale.

If atoms were rational beings, molecular mechanics would be to them such changes of place as we call molar motions, for the sensorium of atoms would be so adjusted that the changes that take place in the molecules would be in the field of their direct observation. Our molar motion would be to them, what the cosmical motions of the stars are to us: they would not be directly observable and any knowledge of them could only be inferred by a complex process of reasoning.

We do not regard it as purely accidental that mechanical laws are more satisfactory explanations than formulas of electrical or chemical actions. The latter are mere names of unexplained processes; and they will remain mysterious to us until we understand how the various particles of matter move about according to purely formal laws.

If Professor Mach does not follow us it is partly the scientist's punctilious anxiety not to leave the *terra firma* of facts, partly perhaps because he does not emphasise, as we do, the radical difference between the formal and the purely sensory elements in experience. He makes the statement that science results in an economy of thought as a matter of fact and does not attempt to explain how economy of thought is possible. We find that the universality of the formal law is the reason why a recognition of it naturally results in an economy of thought. From our standpoint the law of the conservation of energy is an empirical formulation of the philosophical statement "all causation is transformation." We may add that whether or not Professor Mach would be willing to follow us, our view does not stand in contradiction to his but can be conceived as a wider application of it and a further corroboration of its main principles.

The ultimate aim of comprehension is to reduce all difference to a variety of form and thus to describe reality in terms of formal sciences. Hence the importance of measuring and numbering; of graphic formulas or any other conceptions of tridimensional relations. All phenomena in the world would be explained if their differences could be understood as due to a difference of form, while the innermost nature of reality is conceived as the same throughout.

THE METAPHYSICAL *x* NOT UNKNOWN.

There is no serious objection to regarding all scientific cognition, knowledge, explanation, and comprehension, as description or representation of facts in mental symbols. But we have stated ourselves that explanations can be satisfactory only when the descriptions of phenomena are reduced to terms of form, while the innermost nature of reality is supposed to be and to remain the same all through. Is not what we here call "the innermost nature of reality" the surd, which lies without the pale of science, and whether or not we call it metaphysical, will always remain unexplained?

No, it does not remain unexplained, for it is the very material on which and with which our cognition is written; it is the best-known reality and most familiar of all facts, for it is the innermost nature of our own being. It is both the slate and the slate-pencil, which in their interaction produce those writings which we call the soul.

We must bear in mind that monism teaches the inseparableness of subject and object, and the innermost nature of that which appears to you my body is what I call "my soul"; while the subjectivity, which varies with the forms which it ensouls, is an intrinsic feature of all objectivity, and there is, according to our best scientific notion, no particle of the ultimate substance of which the world consists, which could not, as well as any other particle, in the course of its migration, have become an essential ingredient of the thinking brain.

Schopenhauer was perfectly aware of this fundamental doctrine of monism, but he makes no good use of it. Schopenhauer says:

> "The source of the knowledge of metaphysics is not *outer* experience alone, but also *inner*. Indeed, this is most peculiar to it, and hereby the decisive step which alone can solve the great question becomes possible . . . that at the right place it combines outer experience with inner, and uses the latter as a key to the former."

Schopenhauer solves the metaphysical problem as to what is

the innermost nature of things by saying, it is the same as the innermost nature of ourselves, viz., the will, using the term "will" in a peculiar sense; and the trend of his solution is correct.

This procedure practically identifies the metaphysical with the subjectivity of existence, and we accept it without hesitation; but in doing so we bear in mind that we do not enter here into a domain from which science is debarred. An investigation of the subjective nature of ourselves and other sentient beings is commonly called psychology and not metaphysics, and the methods of psychology are the same as the methods of any other science. Explanations are as much descriptions in psychology as in physics; there is only this difference, that what Schopenhauer calls metaphysics is, as it were, generalised psychology. We attribute to other beings, according to their form, subjectivities analogous to those which our own bodies possess. Now, suppose we call such a generalised psychology by the traditional term "metaphysics," and the innermost nature of reality "things-in-themselves," we should most certainly not be justified in saying that our cognition invariably leads us to an x, that we always arrive at an unknown quantity, concerning the nature of which we cannot have the faintest idea or comprehension.

The method of monism is to interpret the facts of objective experience in the terms of our subjective nature; and to interpret the phenomenal universe as analogous to our body. All reality appears to sentient beings as matter moving in space, but it is in itself either soul, or where it is not actual soul, potential soul, viz., that subjectivity which, as soon as it is organised, becomes soul according to its form.

The science of a generalised psychology or metaphysics would have to explain how the ultimate constituents of man's soul are the same as the subjectivity of a burning flame or of a falling stone. It would have to explain how the subjectivity, plain and simple as it appears in inorganic nature, builds up a higher life in organised animal nature, where it becomes feeling, and how feeling becomes mind by being representative of the various objective conditions which produce a variety of feeling.

Schopenhauer says (*ibid.*, p. 202):

"How can a science that is derived from experience lead beyond experience, and thus deserve the name of metaphysics? It can *not* do so in the same way as, according to the rule of three, the fourth number, or as from two sides and an angle the third side of a triangle is found. . . . The whole of experience is like a cryptography, and philosophy is its explanation, the correctness of which is proved by the sense that appears in the context. If the whole is only understood in its full depth and connected with inner and outer experience, it must be possible to be interpreted and explained out of itself."

If metaphysics denotes "that which ventures beyond experience" (this is Schopenhauer's definition), we deny the existence of metaphysics, for our subjectivity is as Schopenhauer himself says, inner experience. Our soul is the metaphysical essence of our bodily being, and what is better known to us than our own existence? Neither is the object of metaphysics, viz., the so-called thing-in-itself, or the innermost nature of being, i. e., the subjectivity of existence, anything that lies beyond or behind nature and outside of the range of science. On the contrary, it is the heart of nature, its essence or the inner nature of nature. The metaphysical, accordingly, is so far from being outside of experience that it is the very cornerstone of the possibility of experience. It does not lie beyond the limits of our cognition of nature[1] and involves us in no ignorabimus. It does not

---

[1] Du Bois-Reymond speaks of the *Grenzen des Naturerkennens*.

Du Bois-Reymond's proposition, that "if only one single brain-atom could be moved by thought one-millionth fraction of a millimetre from the path prescribed by the laws of mechanics, the whole world-formula would cease to have meaning," is quite true, if by thought is understood the mere subjectivity of thought, while the objectivity is considered as operating without our taking reference to its subjectivity. But we must not forget that there are no thoughts which are not at the same time brain-motions; and there is no question about it that while a man thinks the atoms of his brain do move; and these brain-motions, small though they are, are of enormous consequence, for they, being the exponents of conscious aims, bring purpose into the world of physical causation, which renders "the world-formula" such as a physicist may propound by confining his attention to mechanics alone, but is immeasurably more complex, without annulling it. Du Bois-Reymond's proposition is misleading, because the word "thought" is an abstraction, and there are as little ideas which are not at the same time motions, as there is gravity outside of mass. He might as well have said: "Gravity exercises no influence in the world which is strictly governed by mechanical law. If one single dust-particle could be moved by gravity one-millionth fraction of a millimetre from the path prescribed by the laws of mechanics, the whole world-formula would cease to have a meaning." And the same proposition can be varied *ad libitum*. In the same sense, "chemical affinity" can-

commit us to a belief in anything intrinsically unknowable, which is always the confession of a philosophical insolvency. It is so far from being foreign, unknown, or incomprehensible to us that it forms the very essence of our own existence. For this same reason Goethe objects to the idea of the inaccessibility of Nature's interior. He says:

"Schritt für Schritt
Sind wir im Innern."

The method, however, by which we arrive at the conclusion that the inner nature of other things is analogous to our own inner nature is exactly the same rule of three which Schopenhauer regards as insufficient. He himself applies it unconsciously, while Clifford gives precision to Schopenhauer's solution of the problem by saying:

"*As* the physical configuration of my cerebral image of the object

"*Is to* the physical configuration of the object,

"*So is* my perception of the object (the object regarded as complex of my feelings)

"*To* the thing-in-itself."

In other words:

As the brain-structure (which is matter in motion) is to its analogous idea, so the object is to the innermost nature of the object. Or as cerebral activity is to my soul, so the material object (the phenomenon) is to the soul of the object as the object is in itself.

This conception, which is a consistent monism, recognises the spirituality of all existence, but it excludes the possibility of ghosts. Ghosts are bodiless souls, and souls, wherever they exist in reality, will, by the very fact of their existence, appear as material bodies to other sentient beings, and must originate, act, and evolve according to the mechanical laws of change. They cannot be conjured by magicians from the vast inane, but must develop in nature according to the laws of nature. On the other hand, the laws of nature do not give us an account only of purely material phenomena; by revealing

---

not move a single atom, and if it could, the laws of mechanics would be meaningless.—(Compare *The Monist*, Vol. III, No. 4, pp. 612–615, where this subject is discussed in detail.)

the laws of the physical exterior we can decipher the spiritual (the subjective, or, if you please, metaphysical) interior of the various objects that people the world around us.

CONCLUSION.

A clear conception of the nature of knowledge, is one of the most indispensable requisites of a sound world-conception; for knowledge—using the word in a broad sense—is the nature of mind. It is the characteristic attribute of the soul of man. If we understand what knowledge is, we know the nature of our own mentality, and what can be of greater importance to us than the fulfilment of the old injunction *ΓΝΩΘΙ ΣΕΑΥΤΟΝ!* Know thyself!

The importance of a comprehension of the innermost nature of being (which we call subjectivity) is greatly exaggerated. It is frequently regarded as the object of metaphysics, and according to a fashionable mysticism claimed to be incomprehensible. If this metaphysical centre of being could be known, so the argument commonly runs, we should have the key to all the riddles of the universe. Its comprehension is regarded as a kind of philosopher's stone, and if a scientist could find the value of this x, he would be in possession of the solution of all problems. This is a great error. A misconception of that feature of existence which in living substance becomes feeling and in man blazes forth as consciousness, will throw all thought into confusion, but a right conception of it does not involve the advantage that in the future we can dispense with the drudgery of scientific investigation, as though the acquisition of further knowledge had become redundant. Faust's hope of opening channels of wisdom by magic is a mistake. The world-problem does not lie in what Schopenhauer calls the metaphysical, but it reveals itself in objective nature. There it must be sought and there alone it can be found. He who does not find the correct solution should find fault not with reality, but with himself. The world is not unintelligible, but the man who is unable to decipher its wonderful cryptography is unintelligent. Faust is quite conscious of the fact that his inability to acquire genuine knowledge is his own fault. He says:

"The spirit world no closures fasten ;
Thy sense is shut, thy heart is dead.
Disciple up ! Untiring hasten
To bathe thy breast in morning-red."

["Die Geisterwelt ist nicht verschlossen :
Dein Sinn ist zu, dein Herz ist todt.
Auf, bade, Schüler, unverdrossen
Die ird'sche Brust im Morgenroth."]

The elements of subjectivity, being, as it were, the substance out of which the soul has been fashioned, are the same in man as in the dust that is trodden under foot. And Christ's words are literally true when he says: "God is able of these stones to raise up children unto Abraham."

The metaphysical nucleus of reality, the in-itselfness of things and of ourselves does not contain the key to any problem either of science or philosophy. The identity which we must attribute to its nature in all its elementary forms, renders it unimportant as a factor in explanation. The diversity, however, which it exhibits in its various combinations, now as phenomena of inorganic nature; now again as the irritability of a plant, and here in us as the soul of a rational being, depends upon the forms which it assumes, and these forms become tangible, visible, and observable in the objective world. The parallelism of subjectivity and objectivity teaches us that the things-in-themselves of objects are as much combinations of the elements of the metaphysical essence of all reality, as the objects under our observation appear to our senses as combinations of material elements.

* * *

Summa summarum : The source of knowledge is inner as well as outer experience, observation as well as introspection, but metaphysics is of no avail. Metaphysical philosophies must give way to the only true philosophy—which is the philosophy of science.

The peculiar nature and the worth of man lies not in what metaphysicians call the thing-in-itself,—granting here the propriety of the term,—it lies not in the presence of any metaphysical essence, not in the subjectivity of his existence, but in the truth of the im-

ages and ideas of which his soul consists. Man's soul is a description of reality *sub specie aeterni*; it is an image of God. God enters, as it were, in parts with every sense-impression into sentient creatures, and his likeness grows in clearness as the traces thus produced in living feelings reconstruct the World-Logos, which in man's soul appears as the divine spark called Reason. The progress of man's comprehension of natural phenomena, revealing the cosmic order of the universe and teaching the right conduct in life, is the history of God's revelation.

EDITOR.

THE UNSEEN UNIVERSE.

WONDERFUL indeed are the number and the variety of the objects which nature discloses to our view, both in the heavens above, and in the earth beneath. A little reflexion will, however, show us that the things which we can either see, or of which any of our senses can inform us, must nevertheless be almost inconceivably small and unimportant in comparison with those objects in the universe which from one cause or another remain necessarily undiscernible.

It is indeed possible to demonstrate that objects do certainly exist which are not only utterly screened from view, so far as our present resources extend, but which there is not the least reason to anticipate that any future discoveries can introduce to our ken. We might illustrate this proposition from a variety of departments of nature. It is, however, my present purpose to speak only of that unseen universe, which is the most astonishing of all the many astonishing subjects which the astronomer leads us to contemplate.

The whole question as to whether an object shall be visible to us or not is largely a matter of illumination. If the object be bright enough, and if the distance at which it is situated be not too great for the degree of brightness which the object possesses, then that object will generally be visible. We should, however, provide that the sensibility of the retina to the impression of light is not to be reduced by the presence of an undue quantity of diffused light from some other source. A star is generally just visible to us at night by the unaided eye if it possesses that degree of brightness, indicated in the language of the astronomer, when he says that the star is of the sixth magnitude. If that star were moved further away then it

would presently cease to be visible to the unaided eye, though it might still be discerned with the aid of a telescope. The larger the telescope, the greater the depth to which it is able to probe into space. Indeed, it may be said that a star just visible to the unaided eye, would have to be removed to a distance about one thousand times greater, before it had ceased to be visible in the great Lick telescope, or in the great reflector of Lord Rosse at Parsonstown. Were the star to be translated ten thousand times as far as when just visible to the unaided eye, it would apparently be then utterly beyond the reach of any telescope at present existing. It seems, however, possible that even this distance might not be so great as to preclude some stars from recording their impressions in a photographic apparatus when a sufficiently long exposure has been given.

It should, however, be remembered that though in broad daylight stars shine over our head, yet we cannot in general see those stars. The reason is simply that the nerves of the retina are so strongly acted upon by the abundant floods of daylight that the twinkle of even the brightest star fails to produce any recognisable impression. No doubt stars, or at all events, the brighter stars, can be rendered visible in daylight with our telescopes. Supposing, however, that we had lived in perpetual daylight, as we might have done if it had happened that the earth turned round the sun, with the same face always directed thereto, just in the same way as the moon goes round the earth; then, if we had had no telescopes we should never, under ordinary circumstances, have seen the stars. We might indeed have occasionally glimpsed the planet Venus, but with this possible exception we should never have known anything about any other bodies in the universe, save the sun and the moon. All that glorious sidereal spectacle which is disclosed to our gaze at night, would have been utterly unknown. The starry firmament would have formed an invisible universe.

Suppose that a being lived on a world constituted in this manner, then if the sun were to be suddenly eclipsed the whole of that universe, previously invisible and unknown, would have been instantly displayed to the astonished observer. There he would behold for

the first time the Great Bear and Orion, and the other glorious constellations, and sweeping across the sky he would see the marvellous yet delicate glow of the Milky Way. If the being were further told that every single unit in this display of twinkling points of light indicated the existence of a sun in many cases quite as great and as glorious as that sun which was the familiar object in his skies, if he were led to realise that these suns existed in scores of millions, and that each one of them was surrounded by a system of planets, attending upon it in just the same way as the planets revolve around the sun, then indeed he would see that the universe as known to him before the eclipse was nothing compared with that hitherto unseen universe of which he had for the first time been permitted to obtain a brief view. The problem of the invisible universe would indeed be one which would astound his imagination.

It is my object in this article to show that the present state of science forces us to believe that there is around us an invisible universe, which far more widely exceeds even that extended universe which we can see, than does our visible universe exceed that of a being whose celestial knowledge was limited to the recognition of the existence of a sun and a moon. This is indeed one of the most striking conceptions which science has to offer to our contemplation. There are different ways in which it can be presented to us, and I shall try to develop it with such detail as its importance deserves.

Let us suppose that an Australian, born and reared in his country, is at length able to fulfil a long-cherished wish, and visit that ancient home in Great Britain from which so many colonies have sprung. He starts on his voyage, passes through the canal, issues from the Strait of Gibraltar, and presently approaches the shores of Great Britain. But as he does so, it happens to be night—he can see nothing whatever of the coast, the only intimation that he has of his proximity to the long-desired shore is given him by the lighthouses. He sees a bright point; he is told it is the famous Eddystone; he passes on a little further, when another bright point comes into view, indicating the Needles at the Isle of Wight. Then again a twinkling point appears, and he discerns the Forelands.

But, except those lights such as I have named, or other objects of the same description, the voyager can see absolutely nothing of the shores of England. Those beacons, however admirably they may fulfil their functions, do not illumine the objects around them in such a way that they would be visible to the mariner. All the mariner can see, and this is the important point, are the lights themselves; he cannot see, he can get no direct intimation whatever, concerning the objects which lie even in the vicinity of those lights.

Let us suppose that our traveller were so absurd as to refuse to entertain any other impression of England save that which could be derived from his midnight voyage along the coast. To him England would then consist of nothing but the few lights which might be discerned at night from the sea. Everything that land contained, its hills and valleys, its rivers and lakes, its great cities and noble edifices, its wonderful commerce, its teeming myriads of inhabitants, its counties studded with vast manufactories, its abounding life and energy of every description, would be invisible. The whole of that unparalleled collection of human activities and human interests, which are associated with the name of Great Britain, would be utterly unknown to an observer whose opportunities were so limited. This wonderful country could only be represented to his imagination by the few beacons which were visible at night. The visible England, so far as he was concerned, would be a few luminous points, the invisible England would be that marvellous country which those lights were inadequate to illuminate.

This illustration will prepare us for the argument on which I am about to enter. The sun to which we owe so much is no doubt a potent agent of illumination, within the narrow limits, the relatively narrow limits, I ought rather to say, of our solar system. But for purposes of illumination through the length and breadth of the universe, the sun is as utterly inadequate, as a farthing rush light would be for the illumination of a continent. We are apt, quite naturally, to attribute to the sun the possession of a peerless splendor. We must, however, remember that the earth is always comparatively so close to the sun, as to receive abundantly of its radiation, and occupying that position we can enjoy light enough, and

heat enough, to supply all our wants. These services, however, the sun would not be able to render to us, did it not happen that our globe was so close to the source of beneficence. How slender must be the solar effect in illuminating or warming the universe generally, may be inferred from the well-known fact, that many of the bright stars, for example, Sirius or Arcturus, are intrinsically far more brilliant than the sun, but yet how feeble is the twinkle which they can transmit to our point of view. No doubt any objects which may lie in the immediate vicinity of Sirius or of Arcturus might derive from either of those bodies, an illumination quite as splendid, or even far more splendid than that which is supplied to the earth by the proximity of the sun. But sun and stars alike are equally ineffective as illuminating agents, when the length and breadth of the universe are considered.

When, therefore, we raise our eyes to the sidereal heavens, we are to some extent in the same condition as the traveller whom we have supposed to reach the shores of England at night. All he can actually see are the luminous beacons, but those beacons have no effective power for the illumination of the surrounding objects, though they themselves are visible. This point being admitted the significance of what is implied by the title of this paper, will at once become apparent. I set aside of course, any reference at present to the planets. They have no light of their own, it is true. They are rendered visible in consequence of the illumination, which, like the earth, they derive from the radiation of the sun. For our present purpose we are, however, considering not the small group known as the solar system consisting of the earth and planets, all these objects are in close proximity to our own sun; but what we are now considering are the stars and other objects sunk into space all round, at distances compared with which the dimensions of the solar system are utterly insignificant.

It is obvious that the traveller we have supposed, would make a most tremendous mistake if he were to conclude that there was nothing whatever in England except a few beacons round the coast. Yet this, it must be observed, is all that he could possibly know of England, if his view of it were obtained at night from the sea, and

if he had no other sources of information. We are very much in the same condition when we look at the sidereal universe. We view it in the dark, in a darkness only rendered more impressive by the numerous beacons twinkling throughout the extent of space. There is no commanding and universally spreading source of light to render celestial objects visible in the same way, as the sun makes terrestrial objects visible here by day. We see on looking into the heavens no more than the celestial beacons. We see only the bright points which are themselves lighted, we cannot discern the objects which having no intrinsic luminosity are unable to appeal to our sense of vision. I do not think that there is in the whole of astronomy a conception more striking than that which is thus suggested. As the coast-lights on our shores are nothing in comparison with the extraordinary variety and multitude of interesting objects in England, which are wholly invisible to the mariner passing at night, so the celestial beacons which we can see are as nothing in comparison with the extraordinary multitude and variety of objects in that invisible universe, which it seems must be forever screened from our view. For every lighthouse which may be counted around the coasts of Great Britain, there are within the circuit of these coasts, thousands of fields, thousands of beautiful trees, there are many lakes and rivers, there are villages, towns, cities, and great numbers of population. So, too, for every one of the visible stars which can be counted in the skies, there must be hundreds or thousands, indeed, there are doubtless millions of other objects, utterly beyond our ken. Of the existence of these unseen objects, and of their nature and properties, we can only occasionally become aware, in a most indirect, indeed, I might say in a most casual manner. Now, indeed, the sublimity of the conception of the unseen universe becomes adequately unfolded. Reflect on the number of luminous stars which the heavens contain, think of the thousands of stars which are visible to the unaided eye, think of the tens of thousands of stars which are visible in small telescopes, think of the hundreds of thousands of stars which are visible in a moderate telescope, and of the abounding millions of stars which are disclosed by our mightiest instruments, or which are represented on our most

sensitive photographic plate. Then remember that each one of these stars is, as it were, a luminous beacon, and that the invisible objects must be incredibly more numerous than the beacons themselves.

In this way we begin to realise that for each body which we see, glowing as a fervent star, there must be thousands or millions of other bodies often as large, often doubtless a great deal larger than the luminous stars. We do not see the great majority of celestial objects from the simple fact that they do not, generally speaking, possess a temperature sufficient to make them glow in the manner necessary for vision. If, indeed, the mind is baffled in the attempt to comprehend the scale of the universe which contains, as we know it does, millions of stars, many of them as bright and as glorious as the sun, what are we now to think when it is brought before us that each one of these stars is itself only one of millions of objects, which happens by the fortuitous circumstance of temperature to be rendered visible?

We may illustrate the line of reasoning that we have followed in another way. We have often heard of those beautiful fire-flies, which, in clouds of dancing points of light, form a striking feature after the night has fallen in certain warm latitudes. Suppose that some celestial being who was taking a survey of our earth at night, when all artificial sources of illumination were absent, was trying to obtain some notion as to the nature of the animated inhabitants of the earth. His survey being made in the darkness would necessarily preclude him from being able to perceive the greater number of living forms. The huge bulk of the elephant, or of the rhinoceros, must pass unnoticed, the stately giraffe would not be visible, lions, tigers, and bears, would be as invisible as cows or sheep. Birds of every size and of every hue must be utterly unknown to an observer so circumstanced, and still more would innumerable hosts of minor creatures remain undetected. Such an observer might in fact hastily come to the conclusion that there was, indeed, no life whatever on this earth. Suppose, however, that he made a very minute inspection, he might discern here and there the little gleam of light from a glow-worm on a mossy bank, here and

there he might detect the indications of phosphorescent sparks in the sea water, here and there he would be gratified by the sight of a cloud of fire-flies dancing about in the darkness. If this celestial being, having duly noticed these things, having counted the number of glow-worm twinkles that he could see, and having depicted or measured the phosphorescent points and the clusters of fire-flies, were straightway to rise up and say that now he knew all about the distribution of life on this earth, how greatly, indeed, would he have been mistaken. No doubt it may be admitted that he would have seen a very large number of creatures. The number of fire-flies in their clustering millions may really rival, for aught I can tell, the number of stars in the Milky Way, or that of the minute stellar points in the deep background of the firmament. But how ludicrously incomplete would be the knowledge of the natural history of this earth, which could possibly be obtained by one whose only opportunity for observing the life on our globe was obtained under the limitations we have sketched. All the more important forms of life would be quite unknown to such an observer, he would really have perceived only an infinitesimal part of the total life on the globe. Those creatures alone would be visible to him, which possessed intrinsic luminosity. The creatures so endowed form it may be an interesting, but certainly only a most insignificant part of animated nature.

In like manner, when we raise our eyes to the skies, we see it is true, a myriad of glittering gems, but these are only the glow-worms and the fire-flies of the universe. That is to say, they are the objects which are visible in virtue of the light which they themselves dispense, while objects which are not endowed with the capacity for radiating luminosity must be as invisible to us, as the birds and beasts on the earth would be to the spectator whom we have just been considering. There can, however, be little or no reason for doubting that the invisible objects in the universe exceed those which are visible in consequence of their luminosity, in a proportion quite as remarkable as that in which the ordinary animals devoid of luminosity exceed those which possess phosphorescent qualities. We must again affirm that the only objects which can be seen by us

in the skies, (setting aside the planets and a few other bodies in the solar system,) are those objects which are self-luminous in consequence of their intensely high temperature. A star is a mass of matter heated to such an extent that its effulgence is perceived far and wide. It must, however, be borne in mind, that for a portion of matter to be heated so highly, is always a more or less exceptional phenomenon. From the very nature of the case, the condition it implies is a temporary one. We find little difficulty in conceiving the eternal existence of matter at a temperature no greater than that of the surrounding space, but when a piece of matter, solid, liquid, or gaseous is heated to incandescence, it is in the very nature of things that this condition is but transient. The high temperature may last, no doubt, as the high temperature of the sun has lasted, for millions of years. It cannot, however, be perpetual, and when at last that portion of matter sinks again to the temperature of space, there it may remain to all eternity unless in so far as by the chapter of accidents it may be again kindled into temporary luminosity. It thus appears that the normal and ordinary state of the matter in the universe is to be cold, non-luminous, and therefore utterly invisible to us. Those portions of matter which are at any moment luminous must certainly be very greatly inferior in numbers to those which are at the same time in the normal condition. Every line of reasoning demonstrates that the material universe, so far as it is visible, can only be an almost inconceivably small fragment of that unseen universe, which, from not possessing the necessary quality of luminosity, is effectually shrouded from our view.

The conclusion to which we are thus led is, indeed, a remarkable one. Think first of the visible stars in their units, in their constellations, and in their myriads, so vast that the imagination of man fails to realise their number. But a much mightier effort would, however, be necessary if we would seek to form a truly comprehensive estimate of the contents of the universe. We are to reflect that all objects which we can see constitute in all probability not one thousandth, perhaps not one millionth, part of the material heavens. We are to reflect that each one of those suns which we

find glowing in the depths of space, is only one out of an untold number of other bodies, many of which are quite as large and many of which are very much larger. Any object that we do see is able to attract our attention merely because of the accidental circumstances that it happens at this particular epoch to be glowing with luminosity. It is therefore essential for any one who desires to obtain a due conception of the scheme of things celestial, to recognise that the glorious universe which we can behold is as nothing compared with that material system of which we can never become adequately informed, and which we call the unseen universe.

Robert Stawell Ball.

Cambridge, Eng.

THE PRESENT PROBLEMS OF ORGANIC EVOLUTION.

THE doctrine of evolution may be defined as the teaching which holds that creation has been and is accomplished by the agency of the energies which are intrinsic in the evolving matter, and without the interference of agencies which are external to it. It holds this to be true of the combinations and forms of inorganic nature, and of those of organic nature as well. Whether the intrinsic energies which accomplish evolution be forms of radiant or other energy only, acting inversely as the square of the distance, and without consciousness, or whether they be energies whose direction is affected by the presence of consciousness, the energy is a property of the physical basis of tridimensional matter, and is not outside of it, according to the doctrine we are about to consider.

As a view of nature from an especial standpoint, evolution takes its place as a distinct science. The science of evolution is the science of creation, and is as such to be distinguished broadly from the sciences which consider the other operations of nature, or the functioning of nature, which are not processes of creation, but processes of destruction. This contrast is especially obvious in organic evolution, where the two processes go on side by side, and are often closely intermingled, as for instance in muscular action, where both destruction of proteids and growth of muscular tissue result from the same acts, or use. Physiology, or the science of functions, concerns itself chiefly with destruction, and hence physiologists are especially prone to be insensible to the phenomena and laws of progressive evolution. The building of the embryo, remains a sealed book to the physiologist unless he take into account the allied bio-

ogical science of evolution, as resting on the facts of botany, zoölogy, and paleontology. In his reflexions on the relations of mind to matter he is likely to see only the destructive functioning of tissue, and not the history of the building of the same during the ages of geological time.

J. B. P. A. Lamarck[1] thus contrasts the theories of direct creation, and creation by evolution. The former asserts: "That nature or its author in creating animals has foreseen all possible kinds of circumstances in which they may have to live, and has given to each species a permanent organisation as well as a predetermined form, invariable in its parts; that it forces each species to live in the place and the climate where one finds them, and to preserve there the habits which it has." He then states his own, or the evolutionary, opinion to be: "That nature in producing successively all species of animals, commencing with the most imperfect or simple, and terminating its work with the most perfect, has gradually complicated their organisation; and these animals spreading themselves gradually into all habitable regions of the globe,—each species has been subjected to the influence of the circumstances in which it is; and these have produced the habits which we observe, and the modifications of its parts." On an earlier page of the same chapter, Lamarck thus formulates the laws of organic evolution, to which his name has been attached.

First law. "In every animal which has not passed the time of its development, the frequent and sustained employment of an organ gradually strengthens it, develops and enlarges it, and gives it power proportional to the duration of its use; while the constant disuse of a like organ weakens it, insensibly deteriorates it, progressively reduces its functions, and finally causes it to disappear."

Second law. "All that nature acquires or loses in individuals by the influence of circumstances to which the race has been exposed for a long time, and in consequence of the influence of the predominate employment of such an organ, or of the influence of disuse of such part, she preserves by generation, in new individuals

[1] *Philosophie Zoologique*, Paris, 1809, Vol. I., Chap. VII.

which spring from it, providing the acquired changes be common to both sexes, or to those which have produced new individuals."

We have here a theory of the origin of characters; viz., of the increased development or loss of parts as a result of use or disuse. We have also the theory that the peculiarities thus acquired are transmitted to the succeeding generation by inheritance.

The next formal statement of the efficient cause of organic evolution was presented by Messrs. Charles Darwin and Alfred R. Wallace in 1859.[1] The cause assigned is natural selection, and Mr. Darwin thus states what is meant by this expression in his work *The Origin of Species*.[2] "If under changing conditions of life organic beings present individual differences in almost any part of their structure, and this cannot be disputed; if there be, owing to their geometrical rate of increase, a severe struggle for life at some age, season, or year, and this certainly cannot be disputed; then considering the infinite complexity of the relations of all organic beings to each other and to their conditions of life, causing an infinite diversity of structure, constitution, and habits, to be advantageous to them, it would be a most extraordinary fact if no variations had ever occurred useful to each being's own welfare, in the same manner as so many variations have occurred useful to man. But if variations useful to any organic being ever do occur, assuredly individuals thus characterised will have the best chance of being preserved in the struggle for life; and from the strong principle of inheritance, these will tend to produce offspring similarly characterised. The principle of preservation, or the survival of the fittest, I have called natural selection. It leads to the improvement of each creature in relation to its organic and inorganic conditions of life; and consequently in most cases, to what must be regarded as an advance in organisation. Nevertheless, low and simple forms will long endure if well fitted for their simple conditions of life."

It is readily perceived that this statement makes no attempt to account for the origin of variations, but that it simply formulates,

---

[1] *Proceedings of the Linnean Society of London.*

[2] Ed. 1872, p. 102.

as observed by Mr. Darwin, the doctrine of survival of such variations as are most useful to their possessors. This fact is more distinctly pointed out in the same work (p. 63) where the author remarks: "Several writers have misapprehended or objected to the term natural selection. Some have even imagined that natural selection induces variability, whereas it implies only the preservation of such variations as arise and are beneficial to the being under its conditions of life. No one objects to agriculturists speaking of the potent effects of man's selection, and in this case the individual differences given by nature, which man for some object selects, must of necessity first occur." It is evident then that Mr. Darwin did not attempt to account for the origin of variations, but that the service rendered by him and by Mr. Wallace to the doctrine of evolution consists in the demonstration of the reality of natural selection. Darwin also assumes in the statement first quoted above, the inheritance of acquired characters.

In 1865 the *Principles of Biology* of Herbert Spencer appeared. In this work the attempt is made to set forth the laws of organic evolution, in a way which represents an advance beyond the positions of his predecessors. He adopts and harmonises both the Lamarckian and Darwinian doctrines, and is at times more specific in his application of Lamarck's doctrine of the stimulus of the environment, and of use, than was Lamarck himself. Very often, however, Spencer contents himself with generalities; or takes refuge in the "instability of the homogeneous," as an efficient cause. This phrase, however, like his other one, "the unknowable," is but a makeshift of temporary ignorance, and is neglected by Spencer himself, when he can see his way through it. He approaches the cause of the varied forms of leaves of plants in this language:[1] "And it will also be remembered that these equalities and inequalities of development correspond with the equalities and inequalities in the incidence of forces." Language of similar significant but rather indefinite import is frequently used throughout this volume.

But in some cases Spencer is more specific. With reference to

[1] *The Principles of Biology*, by Herbert Spencer, Amer. Ed., 1873, II., p. 143.

the inequality in the basal lobes of the erect leaves of Tilia and other plants, he says:[1] "A considerable deviation from bilateral symmetry may be seen in a leaf which habitually so carries itself that the half on the one side of the midrib is more shaded than the other half. The drooping branches of the lime show us leaves so arranged and so modified. On examining their attitudes and their relations one to another, it will be found that each leaf is so inclined that the half of it next the shoot grows over the shoot and gets plenty of light; while the other half so hangs down that it comes a good deal into the shade of the preceding leaf. The result is that having learned which fall into these positions, the species profits by a large development of the exposed halves; and by survival of the fittest acting along with the direct effect of extra exposure, this modification becomes established." In his discussion of the origin of the characters of animals, Spencer is also sometimes specific. Respecting the development of muscular insertions he remarks:[2] "Anatomists easily discriminate between the bones of a strong man and those of a weak man by the greater development of those ridges and crests to which the muscles are attached; and naturalists on comparing the remains of domesticated animals with those of wild animals of the same species, find kindred differences. The first of these facts shows unmistakably the immediate effect of function on structure, and, by obvious alliance with it, the second may be held to do the same, both implying that the deposit of dense substance capable of great resistance habitually takes place at points where the tension is excessive." Quite as specific is his ascription of the forms of epithelial cells to definite causes, as follows:[3] "Just the equalities and inequalities of dimensions among aggregated cells, are here caused by the equalities and inequalities among their mutual pressures in different directions; so, though less manifestly, the equalities and inequalities of dimensions among other aggregated cells, are caused by the equalities and inequalities of the osmatic,

[1] *Op. cit.*, p. 143.

[2] *Loc. cit.*, p. 200.

[3] *Op. cit.*, p. 260.

chemical, thermal, and other forces besides the mechanical, to which their different positions subject them."

In spite of this not infrequent definiteness, Mr. Spencer occasionally falls into the error of ascribing the origin of structures to natural selection, as in the case of the forms of flowers,[1] and the armor-plates of paleozoic fishes.[2] Spencer assumes the inheritance of acquired characters throughout.

In 1866 Haeckel's *Schöpfungsgeschichte* appeared. In this work the author presents a mass of evidence which sustains the doctrine of evolution, and he combines the views of Lamarck and Darwin into a general system. He says:[3] "We should, on account of the grand proofs just enumerated, have to adopt Lamarck's theory of descent for the explanation of biological phenomena, even if we did not possess Darwin's theory of selection. The one is so completely and directly proved by the other, and established by mechanical causes, that there remains nothing to be desired. The laws of inheritance and adaptation are universally acknowledged physiological facts, the former traceable to propagation, the latter to the nutrition of organisms." Apart from the statement that adaptation is traceable "to the nutrition of organisms," we find nothing in Haeckel's earlier writings which attempts the explanation of the origin of variations, beyond the general position assumed by Lamarck. The distinctive merit of Haeckel is his formulation of phylogeny. Much of this was speculative at the time he wrote, but so far as the Vertebrata are concerned, it has been largely confirmed by subsequent discovery.

Up to this period, the form in which the doctrine of evolution had been presented, was general in its application; that is, without exact reference to the structural definitions of natural taxonomic groups. No attempt was made to show the modes of the origin of any particular class, order, or genus, and only in the most general way in the case of a few species, by Mr. Darwin. Phylogeny was untried, except by Haeckel; and this distinguished author did not

---

[1] *Op. cit.*, p. 153.

[2] *Op. cit.*, p. 288.

[3] *The History of Creation*, Amer. Ed., II., p. 355.

attempt to account specifically for the origins of the divisions whose filiations he set forth.

In the year in which Haeckel's work above cited appeared, Professor Hyatt of Boston and myself took the first step towards the formulisation of a rational theory of the origin of variation, which should accord with specific examples of taxonomy. Quite independently, we selected the simple series presented by the characters of genera in their natural relations, Hyatt in the cephalopodous Mollusca, and I in the Batrachia Salientia. It is probable that Hyatt's[1] article was published shortly before mine. He says of the genera of Cephalopoda: "In other words, there is an increasing concentration of the adult characteristics in the young of higher species and a consequent displacement of other embryonic features which had themselves also previously belonged to the adult period of still lower forms." My own language is:[2] "That the presence, rudimental condition, or absence of a given generic character can be accounted for on the hypothesis of a greater rapidity of development in the individuals of the species of the extreme type, such stimulus being more and more vigorous in the individuals of the types as we advance towards the same, or by a reversed impulse[3] of development, where the extreme is characterised by absence or 'mutilation' of characters." The phenomena of the aggregation of characters in progressive evolution, and the loss of characters in retrogressive evolution, were termed by me acceleration and retardation in an essay published in 1869.[4] In these papers by Professor Hyatt and myself is found the first attempt to show by concrete examples of natural taxonomy, that the variations that result in evolution are not multifarious or promiscuous, but definite and direct, contrary to the method which seeks no origin for variations other than natural selection. In other words, these publications constitute the first

---

[1] *Memoirs Boston Society Natural History*, 1866, p. 193.

[2] *Transactions American Philosophical Society*, 1856, p. 398; reprinted in *The Origin of the Fittest*, p. 92.

[3] The expression "reversed" is unfortunate, *diminished* being the proper word to convey the meaning intended.

[4] *The Origin of Genera*, Philadelphia, 1869.

essays in systematic evolution that appeared. To the explanation of the relations discovered by this research I applied the Lamarckian doctrine of use (or motion) and disuse, and added to that doctrine the effects on animal movements which result from the mental state called effort, in 1871.[1] This constitutes the earliest attempt, so far as I am aware, to demonstrate the influence of mind on organic evolution. Since that period my discoveries in the phylogeny of the Vertebrata through paleontologic investigations in North America have enabled me to present rational explanations for the origin and evolution of a number of particular groups.[2] Important contributions to corresponding histories of the Mollusca have been made by Hyatt,[3] Dall,[4] Jackson,[5] and Beecher.[6] Many other contributions, into which the paleontologic evidence does not enter, have also been made by various authors in Europe and America.

The authors quoted up to this point had all assumed that the progress of evolution depends on the inheritance by the offspring of new characters acquired by the parent, and had believed that such is the fact in ordinary experience. In 1883, Weismann, in an essay on heredity, announced the opinion that characters acquired by the body could not be transmitted to the reproductive cells, and could not therefore be inherited. This doctrine rests on the relation of the germ-cells to those of the rest of the body, which is expressed in the following language of his predecessor Jaeger: "Through a great series of generations the germinal protoplasm retains its specific properties, dividing in every reproduction into an ontogenetic portion and a phylogenetic portion, which is reserved to form the repro-

---

[1] "The Method of Creation," *Proceeds. Amer. Philos. Soc.*, 1871, December; *Origin of the Fittest*, 1887, p. 173.

[2] "The Origin of the Hard Parts of Mammalia," *American Journal of Morphology*, 1889, p. 137.

[3] "The Genesis of the Arietidæ," *Memoirs Mus. Compar. Zoölogy*, Cambridge, Mass., 1889, XVI., No. 3.

[4] Dall, W. H., "The Hinge of Pelecypods and Its Development," *Amer. Jour. Sci. Arts*, 1889, XXXVIII., p. 445.

[5] Jackson, R. T., "Phylogeny of the Pelecypoda, the Aviculidæ, and Their Allies,', *Memoirs Boston Soc. Nat. Hist.*, 1890, IV., p. 277.

[6] *American Journ. Sci. Arts*, 1893.

ductive material of the mature offspring. This reservation of the phylogenetic material I described as the continuity of the germ-protoplasm. . . . Encapsuled in the ontogenetic material the phylogenetic protoplasm is sheltered from external influences, and retains its specific and embryonic characters." In other words, the reproductive cells are removed from the influence of those stimuli which affect and effect growth in the cells of the other parts of the body, so that no character acquired by the rest of the body can be inherited. The bearing of this theory on evolution is thus stated by Weismann:[1] "The origin of hereditary individual variations cannot indeed be found in the higher organisms, the metazoa and metaphyta, but is to be sought for in the lowest, the unicellular." "The formation of new species, which among the lower protozoa could be achieved without amphigony (sexual union), could only be attained by means of this process in the metazoa and metaphyta. It was only in this way that hereditary individual differences could arise and persist." In other words, variation in organic beings above the unicellular forms, has been and is, introduced only by sexual reproduction.

The conclusions of Weismann were derived principally from embryologic research, and his disciples have been chiefly recruited from embryologists. These conclusions have been supported by extensive and exhaustive investigations, which have added greatly to our knowledge of the subject. In order to account for the appearance of characters in the embryonic succession, through influences confined to the germ-plasma, Weismann invented a theory which requires the presence of distinct molecular aggregates within it, which represent the potentialities or causes. To these he has given the names of ids, idants, determinants, etc.

Weismann has, however, subsequently modified his views to a considerable extent. He has always admitted the doctrine of Lamarck to be applicable to the evolution of the types of unicellular organisms. His experiments on the effect of temperature on the production of changes of color in butterflies, showed that such

---

[1] *Essays*, p. 296. For a complete account of Weismann's views, see *The Germ-Plasm*, 1893.

changes were not only effected, but were sometimes inherited. This he endeavors to explain as follows.[1] "Many climatic variations may be due wholly or in part, to the simultaneous variation of corresponding determinants in some parts of the soma and in the germ-plasm of the reproductive cells." This is an admission of the doctrine which in 1890 I called Diplogenesis.[2] It appears to have been first propounded by Galton in 1875.

From what has preceded, two distinct lines of thought explanatory of the fact of organic evolution may be discerned. In one of these the variations of organisms which constitute progressive and regressive evolution appear fortuitously, and those which are beneficial survive by natural selection, while those which are not so, disappear. Characters both beneficial and useless or harmless, which are acquired by the adult organism, are not transmitted to the young, so that no education in habit or structure acquired by the adult, has any influence in altering the course of evolution. This is the doctrine of Preformation. From this point of view the cause of the variation of organisms has yet to be discovered.

The other point of view sees in variation the direct result of stimuli from within and without the organism; and holds that evolution consists of the inheritance of such variations and the survival of the fit through natural selection. This is the doctrine of Epigenesis. To this I would add that in so far as sensations or states of consciousness are present, they constitute a factor in the process, since they enable an organism to modify or change its stimuli. The position of each of these schools on each of the questions to which reference has been made, may be placed in opposition as follows:

1. Variations appear in definite directions.	1. Variations are promiscuous or multifarious.
2. Variations are caused by the interaction of the organic being and its environment.	2. Variations are "congenital" or are caused by mingling of male and female germ-plasmas.
3. Acquired variations may be inherited.	3. Acquired variations cannot be inherited.

[1] *The Germ-Plasm*, Contemporary Science Series, 1893, p. 406.

[2] *American Naturalist*, December, 1889; published in 1890.

4. Variations survive directly as they are adapted to changing environments. (Natural selection.)	4. Variations survive directly as they are adapted to changing environments. (Natural selection.)
5. Movements of the organism are caused or directed by sensation and other conscious states.	5. Movements of organism are not caused by sensation or conscious states, but are a survival through natural selection from multifarious movements.
6. Habitual movements are derived from conscious experience.	6. Habitual movements are produced by natural selection.
7. The rational mind is developed by experience, through memory and classification.	7. The rational mind is developed by natural selection from multifarious mental activities.

It is not my object to present the available evidence on both sides of each of the questions above enumerated, for I must here be satisfied with having formulated the problem. I shall treat the subject at full length in a forthcoming book, in which I propose to submit certain facts, in support of the doctrines contained in the left-hand column of the above table. My aim will be to show in the first place, that variations of character are the effect of physical causes; and second, that such variations are inherited. The facts adduced in support of these propositions will be necessarily principally drawn from my own studies in the anatomy, ontology, and paleontology of the Vertebrata. It will be my aim, moreover, to co ordinate the facts of evolution with those of systematic biology, so that the result may be as clearly presented as possible. The failure to do this by the founders of evolutionary doctrine has given their work a lack of precision, which has been felt by systematic biologists. The detailed application of the principles of Lamarck and Darwin has been the work of their successors, and has necessarily thrown much new light on the principles themselves. We have at present ampler means than ever to consider the validity of the general propositions on which the doctrine of evolution rests.

E. D. Cope.

Philadelphia, Pa.

THE SCIENCE OF MENTATION

AND

SOME NEW GENERAL METHODS OF PSYCHOLOGIC RESEARCH.

BY mentation I mean the totality of the conscious and subconscious adaptive functionings of a living organism.

Bio-psychology is that department of the science of mentation which studies organic structures and their environments in order to determine the relations which exist between these and the mentations which accompany them. It studies such structures and environments which nature provides, and so far its method is that of observation; but it also artificially varies organic structures and environments, and to that extent its method is experimental. As experimental bio-psychology, it varies structure to determine function; and its scope includes three great sciences:

1. *Biologic Psychology*, which is that department of the science of mentation wherein our knowledge of mind is obtained by a scientific study of (A) organisms and their anatomical and molecular structures as exhibited by nature, and as varied by definite experimental conditions artificially produced; and by a study of (B) the cosmic environment of such organisms as exhibited in nature, and as varied by definite experimental conditions; and also by a study of (C) the mentations of organisms as exhibited in nature in environments that have not been artificially disturbed, and as exhibited under the definite experimental conditions of organism and environment before mentioned. In other words, this science studies the individual organism as *one* factor in producing mentation of a defi-

nite kind; and the cosmic environment as a *second* and (at least) equally important factor in the production of that mentation in a particular organism and environment; and the mentation as the *third* factor. Annihilate the second factor and the third would be impossible. Mentation is a product of the interaction of the individual organism and the cosmos of which the organism is a functional part.

The conception of this science which this classification promulgates demands a more exhaustive study of the organism (*a*) as part of the totality of organic life upon earth, and (*b*) as an individual whole, and of its (*c*) anatomical and (*d*) molecular constitution. It demands what is almost a new feature in biology and psychology, namely, a systematic study of the environment of an organism, and the co-ordination of such data with the data derived from the study of organic structures and the mentations of organisms. The adaptive activities of organisms and organic parts must be co-ordinated with the conditions of the environment. This department of research seeks to discover the laws of mind by observing the modifications of mentation which occur when organic structures and their cosmic environments are varied either artificially or naturally. It includes within its province, as one of its subordinate departments, what has hitherto been called "physiological psychology," and most of "psycho-physics." Biologic psychology, is, of course, physiological, but it is also anatomical, climatological, pathological, chemical, morphological, physical, geographical, zoölogical, botanical, paleontological, etc. The word "biological" is intended to be more comprehensive than the word "physiological" according to its usual significance, but it is to be distinctly understood that in keeping with the best modern thought *all* of the activities of an organism come within the province of physiology. The term physiological psychology does not sufficiently indicate the fact that in studying mind we must study cosmic environment, anatomy, morphology, organic physics, bacteriology, geographical distribution, and all the phenomena of organic life in direct relation to mentative phenomena.

Every structural or morphological difference is accompanied by a difference in function; and even in the same macroscopic and mi-

croscopic anatomy there is a further variation of function with every difference of a chemical and quantitative kind. By a study of all organisms with their molecular and molar structural differences throughout the entire scale of organic life; and by a study of the environments in which given organisms are found; and by a study of the particular mentations which occur in given organisms in given environments, we obtain a knowledge of mind as related to structures and environments of the kind which we have studied; and in so far as we may be able correctly to generalise, we may obtain a knowledge of the laws of mind which must characterise mentation everywhere and everywhen.

Observational biological psychology observes the organisms which nature has furnished, and *as* they are furnished. It is familiar only with such organisms and environments as it finds. Nature does the experimenting. Nature varies environment and evolves organisms, and the organisms exhibit certain phenomena in certain environments—we inventory what we see, and from a course of scientific thought about the data we arrive at generalisations concerning mind. The kinds of organisms and structural variations which we might wish to see in order to have certain questions answered we do not always find. Whole geologic eras have not furnished such environmental changes as would settle certain doubts and answer certain questions I have in my mind—but I can in a short time create such conditions of environment, and by doing so I enter the domain of experimental biological psychology. Nature does indeed make variations innumerable, both in structure and environment, but seldom does she make that particular variation which the student may happen to need to complete the investigation on hand—she pays no attention to the logical needs of our researches when she evolves organisms. But, accepting nature as we find her, and observing what she offers, we may make progress in knowledge of mind if we properly direct and organise our observation.

Experimental biological psychology does not depend upon nature alone to furnish for our study the incidents and phenomena of organisms and their environments, but regulates natural things in such a manner as to "artificially" produce such phenomena as

may be desired, or rather such classes of phenomena as may be necessary to give continuity to a systematic investigation of a given subject. In observational biologic psychology we simply observe what happens without our interference; in experimental biologic psychology we also practice observation, but we do something more, namely, we artificially vary the organic structures and environments and observe the concomitant variations of mentations.

In this domain the new method of research was definitely initiated by my experiments in the artificial transformation of lower organisms[1] by artificially regulated selective propagation in order to determine the precise mentative variations which accompany the evolutionary rise of given structural variations.

This method enables the experimentalist to vary and alter the structures of an organism without vivisections and mutilations, which latter methods give, not normal functional results, but pathological conditions. But to place organisms in a circumscribed environment whose conditions can be regulated and maintained, and selectively propagate them with reference to the development of some structural characteristic, *gradually augmenting* the specific conditions of the environment which demand the excessive development of that selected characteristic until all the individuals of a multitude succumb except the few able to survive; again propagating a multitude under more severe conditions and then suddenly increasing the specific condition to which they must become adapted, until all but a few are killed, and so on, until the particular structural character has been enormously developed, enables the student to vary structures without vivisections and mutilations and to study the mentations as they arise, and thus arrive at a knowledge of the relations between structures and mentations.

The retrogression and gradual disappearance of a structural characteristic from an organism by this method also furnishes excellent data for the study of the mentations which normally accompany a given morphology and anatomy and metabolism. The con-

[1] First account of which was given in a lecture to the Philosophical Society of Washington, May, 1894, in which I described the results obtained in artificially evolving and retrogressing the *Volvox globator*.

trast between a structure retrogressed, and the same highly evolved, brings into conspicuous notice the precise mentative peculiarities of a given structural condition.

The gradual differentiation of a structural characteristic into divergent lines of evolution and retrogression by the method of artificial transformation of organisms enables the student to witness the rise and concomitant modifications of the accompanying mentations.

This method enables the student to select any characteristic of an organism, whether anatomical or chemical, and by retrogressing or evolving it, accentuate its mentative characteristics.

This method brings into conspicuous notice the relation between specific environmental conditions and structural modifications on the one hand, and the relation between environmental conditions and mentative modifications on the other hand. Structure and environment react upon, and modify, mentation; and, as will be seen, under psychological biology, mentation reacts upon, and modifies, structure and environment. Action and reaction are equal and opposite.

2. *Subjective bio-psychology*, which is that department of the science of mentation whereby our knowledge of the mind is obtained by a study, not of the structural and mental phenomena of other organisms, but of the introspective phenomena of our own minds as we alone know them in our own consciousnesses. It makes a study of the introspections of organisms as recorded and experienced by those organisms themselves—and this almost entirely limits this science to the human race as subjects. The individuals of different races and nationalities and occupations and sexes and ages and pathological conditions make a record of their own subjective experiences of consciousness—and these records compared with the student's own introspections constitute some of the data of this science. Such a record when once collected will constitute a natural history of the human faculties. It needs much to be made. It must study also the introspections which accompany particular anatomical, chemical, geographic, climatological, dietetic, and other conditions to which the individual may be subjected. It must ob-

serve these as presented by nature, and as varied by artificial experimental conditions. It must study the relation between environment and introspective states, by artificially varying the environmental conditions and recording the concomitant mentative (introspective) changes. The different metabolisms of the system affect introspections; so do different attitudes, gestures, colors, sounds, temperatures, humidities, electrostatic conditions of objects and the atmosphere, altitudes, smells, tastes, touches, movements, and so on, *ad infinitum*. In brief, this science inventories introspections, and finds out what kinds and degrees and successions of introspective states accompany certain anatomical and chemical conditions of the organism and certain conditions of the environment. The new method of experiment consists in artificially varying organic and environmental conditions and observing the concomitant variations in the introspective states of the student.

3. *Sociological psychology* is that part of the science of mentation which arrives at a knowledge of mind by studying the social organism of animal life as a whole, and of each species of animal and plant in particular, so as to obtain scientific knowledge of the social or group-anatomy of societies of individuals of the same or different species, and of the relation of these individuals to the whole social organism (social chemistry). It studies these phenomena as presented by nature and as varied by definite experimental conditions artificially produced. It also studies the environmental conditions of such social groups as exhibited by nature, and as varied by experimental conditions. It varies by the method of artificial transformations of organisms the social whole of a species, so as to produce new social structures and new environments, and correlates the data thus obtained from social anatomies and environments with the concomitant mentative phenomena. This science considers groups of individuals as anatomical wholes, and its new method of research consists in artificially transforming these social wholes and their environments and studying the concomitant mentations. It studies groups in their normal and abnormal conditions. It varies social structure to determine social function, or group-mentation. The social unit is one factor; the cosmic environment is

the second factor; and the third factor is the social, or institutional, mentation which results. Societies of zoöglœa, and groups of plants, constitute the material of this science, just as well as groups of the genus Homo.

I call especial attention to the fact that these three sciences constitute three distinct spheres of experimental research by three different methods, both of observation and experiment, and that from three distinct standpoints we thus obtain a knowledge of mentation. I would also call attention to the three new methods of experimental research, and how they clearly outline the scope and method of bio-psychology.

These three sciences of bio-psychology study mentation from the standpoint of *structure* to determine concomitant *function.* The structures of organisms are studied to determine (1) mentations as observable adaptive phenomena, (2) to determine introspections as known to the student, and (3) to determine mentations as part of a social whole of which the individual forms a part. It studies structure as correlated with the mentations of species of organisms, and as correlated with individual introspections, and as correlated with social mentative phenomena; and studies the structure of social wholes as composed of individuals. Structure is studied (as varied by nature or experimentally) to determine the corresponding kinds of functioning, and the quantitative relations between structure and mentation, in terms of physics and chemistry. It must be remembered that whatever mind may be, it cannot manifest apart from structure, and according to the degree of adaptability of the structure mind manifests. The thought of man cannot occur in the brain of a frog, and for higher mentation to occur in a given brain, a higher order of structures must exist. Remove from a human or animal brain any portion of the cerebral cortex and you remove a certain class of memories, and a certain kind of mental capacity disappears. Structures react upon mentation and modify it,—mind embodies in structures.

Having described the bio-psychological sciences, I will now still more briefly define the psycho-biological sciences. The three psycho-biological sciences study organisms from the standpoint of men-

tation—they study function in order to determine structure. Biology becomes a psychological subject. Mind is studied in order to find out what organisms are. In the bio-psychological sciences organisms are studied to find out what mind is. If we had no experience with organisms we would know nothing about mind. If we had no experience with mind we would know nothing about organisms.

Psycho-biology studies structures from the standpoint of mind, and interprets organic and cosmic phenomena in psychologic terms. This is the true basis of research. It is the mind that interprets phenomena. It is the mind that creates all sciences and institutions. The mind must have experience with itself before it can have experience with anything that is not itself. From the standpoint of consciousness we survey and know the not-self, and only in terms of mind can we know and define anything.

The psychological sciences study mind as varied by nature, and as varied artificially, in order to determine the corresponding structures and environmental conditions, and to interpret them in psychic terms; and to formulate the quantitative relations between mind and its embodiment in organic structure; and between mind and the environment of its embodiment. These three sciences are:

4. *Psychologic biology*,—which, in its subject-matter, method, and standpoint, is the exact opposite of biologic psychology,—studies the different kinds of minds and the different kinds of mentations in each given mind, to determine the nature and significance of organisms and environments. The purpose of research in this domain is not to find out directly what mind is, but from ascertained mental data and from psychic experiment to learn what organisms are, and what the different conditions of environment signify. Organisms are classified, not primarily according to genesis, or morphology, or distribution, but according to mental characteristics. Biologic classification and taxonomy becomes psychologic. Organisms, being mind-embodiments, their taxonomy is based upon the kind and degree of mind which has been embodied. The mentation is the basis of classification. Organisms are interesting in this domain because of the way in which they have structurally embodied a given amount of mind in any class of mental functioning.

Psychologic biology studies the anatomy of minds, and the elements of conscious and subconscious mentations as presented by nature and as varied by definite experimental conditions, and determines the concomitant conditions of environment and of organic structure.

The new method of research in this realm consists in varying artificially the mentation of an organism and studying the structural changes produced by these varied mentations in that organism and in the environment. Functioning creates and precedes structure. The organism is caused to engage in special kinds of mentation, and is induced to exercise those special kinds of mental functioning to an unusual degree and for a long time, and then its cerebral and subcerebral structures are histologically and chemically compared with those of an organism of the same age and species which has been deprived of the opportunity to exercise those particular mental faculties, and thus can be determined the exact relations between organic structure and metabolism on the one hand, and mentation on the other hand. This new method of research is of greater importance, perhaps, than any of the others. Out of it grows an art of brain-building or mind-embodiment, and other important scientific and practical results. It places psychology upon an experimental basis that enables us to determine functional localisation of mental faculties and quantitative relations between mentation and structure.

Great advancements in knowledge are ever associated with new methods of research and new technic. The history of our knowledge of histology amply illustrates this. Out of the new method which characterises this branch of the science of mentation many important results have been obtained, both to science and art, and as yet the possibilities of the method have hardly been inaugurated.

To restate the method more elaborately, it may be described as follows: It consists in depriving an animal from birth until death of some one definite kind of mental activity, and then comparing its cortical structures and cortical chemistry with that of another animal of like age and species which has not thus been deprived of the using of that function of the mind, and noting the structural differ-

ences between the two. Of course, important results are obtained by examining also the sub-cerebral ganglia and other nervous tissues, and even any and all organs of the body down to the changes in individual muscular fibres. This enables one to determine the structural relations between a given mental activity and brain-development when that activity has been normally exercised and when it has not been exercised. The same method is extended and made more instructive when both of the animals just mentioned are compared with an animal of like age and species to which has been given an extraordinary development of that same definite mental function by causing it to excessively exercise that same faculty of which the first-mentioned animal was deprived. One result of these two ways of applying the method of research is, that it illustrates forcibly the fact that an unused faculty leaves some part of the brain deficient in those psychic structures which are to be found in that part of the brain of an animal which has used that faculty; that wrong use of a faculty develops abnormal structures in that part of the brain where that function has been structurally embodied ; and that extraordinary use of any one mental function creates in the corresponding part of the brain an extraordinary development of cortical structures in which that extraordinary mental faculty is embodied. It proves that more brains can be given to an individual than it would otherwise, by any natural development, have possessed.

In one series of experiments seven shepherd puppies were confined in a completely darkened room from the moment of birth until they were nine months old. Triple doors guarded the darkness of the room in which the puppies were confined. This permitted the mother to go in and out without allowing light to enter the room. The front doors were opened, and when the mother entered the hall-way the doors were closed behind her, and she was allowed to remain there some minutes until the phosphorescence had subsided, and then she was admitted into the second compartment and the doors closed behind her. After a few minutes she was admitted into the room where her children were. Thus for nine long months these puppies were deprived of light. They were then chloroformed,

and their brains, spinal cords, and other ganglia, were prepared and preserved for microscopic and chemical examination. Their eyes were also preserved. A second group of shepherd puppies of the same age were allowed to lead a usual life normal to the average dog, and without deprivation or special training of the seeing function. At nine months they also were chloroformed, and preserved for examination. A third group of the same kind of puppies were subjected to a prolonged training of the seeing functions. The hall leading into one room of my laboratory was covered with squares of metal, each square insulated from the others, and colored. These squares of metal were connected with an induction coil, with the exception of those of a certain color which were not thus connected. It was so arranged that a dog might jump from one square to another of the same color and thus pass through the entire length of the hall without getting an electric shock. To do this the dog had to discriminate between that color and all the other colors tinted upon the metal squares. An attentive dog after having been shown several times would learn to avoid the slight shock which he would invariably get when he stepped upon the wrong color. This enabled me to know whether the dog actually discriminated between given colors, and also enabled me to compel him to practise this discriminating between colors several times daily for five months. I was thus able to determine whether the dog actually saw all of the colors, and to exercise him in the function of seeing the colors and discriminating between them. It enabled me to compel other dogs to see only certain colors and to discriminate between certain colors only, and thus determine the functional localisation of color-functions. It enabled me to cause the dogs to associatively integrate their color-memories with definite motor-memories from the movements necessary to avoid getting shocks from certain colors on going through the hall.

I varied this device somewhat by feeding the dogs from under inverted pans which they were compelled to turn over in order to get a mouthful of meat that had been previously placed under them. All of the pans were rubbed with meat to prevent the dogs from selecting those with meat under them by the sense of smell. Meat

then having been placed under, say the yellow pans only, the dog was shown where to get his breakfast. For several weeks they would indiscriminately turn over all the pans without reference to color. By and by they would gradually hunt out the yellow pans more frequently than those of another color, and after about six weeks of practice (being then five months old) some of them would turn over only yellow pans. Then the meat was placed under a differently colored pans until the dog had again learned his lesson, and so on, until finally several dogs were able to discriminate between seven shades of red (not purple and red), several greens, and so on. One dog learned to examine all of the pans as he came to them until he found meat, and after that he would turn over only pans of that color—he had made a generalisation, had reasoned from phenomena to a principle applicable to his daily life.

The brains of these three groups of dogs were examined and the following general results were established :

The group which had been deprived of the use of the seeing-function exhibited an undeveloped cortex in the occipital seeing areas ; the second group which had been allowed to lead a usual life had a more highly developed cortex in this same region—it was thicker, more vascular with arteries, veins, and lymph-channels, was more grey, and had a greater number of brain-cells. The former group could not be said to have brain-cells in the seeing-areas, so undeveloped and few were they ; whilst the second group had well developed brain-cells in the usual number (for a dog). The brains of the third group had a much more highly developed cortex than the second group, it was more grey, thicker, far more vascular, and had a much greater number of brain-cells, and the brain-cells were far more highly developed. These experiments made upon many other dogs besides these mentioned, and upon other animals, fully confirm these results. In all cases deprivation of a mental function was accompanied with a lack of structural development in the corresponding part of the brain, and excessive training of that function was ever accompanied with extraordinary development of the special structural elements of that part of the cortex. Thus in the three groups of dogs just described there were ample evidences of

brain-structure actually having been builded in the brains by the special training, and also of lack of usual development having been produced by deprivation of the opportunity to use a mental function.

Referring to the three groups of dogs first mentioned it is interesting to note that the vasculation was least in those that had been deprived of light, greater in the usual dog, and by far the greatest in the specially sight-educated dog, thus indicating greater activity in those areas in the educated dogs. The greater amount of lymph-drainage shows that the blood-supply was used and transformed into structures whose functioning required food.

The specific gravity of the cortex was difficult to estimate, and it required delicate experimentation to approximate accuracy in the matter. Obviously the density of the grey matter is quite a different thing from the density of the cortex, because the cortex as a whole is filled with veins, arteries, lymph-vessels, etc. In order to determine the specific gravity of the grey matter a small portion was microscopically isolated from vascular tissue and immersed in liquids of different densities until it remained stationary in the liquid and just submerged a short distance from the viscous surface of the liquid. In order to facilitate the attainment of the position of equilibrium of density the liquid was subjected to sound-oscillations of high pitches, which caused the small mass of grey matter to move into the truer position or degree of submergence. By this method the density of the grey matter of the cortex of the seeing-areas of the dogs deprived of light was (on the average) 1·011 ; in the second group of dogs it was higher : 1·018 ; and highest in the third : 1·027. In experimenting with the hearing, and with the leg-movements of dogs I confirmed these results with the other senses.

In the first group of dogs in the seeing-areas I could find only undeveloped neuroblasts without collateral filaments and plumose panicles ; in the second group there was on the average eighty-nine moderately well developed ganglion-cells per square millimetre section, and the axis-cylinders, plumose-panicles, and collateral filaments were observed in moderate number and moderate development. Whilst in the third or educated group there were from one

hundred and four cells upward per square millimetre section of the cortex, and these cells were far more complexly developed in their interior structure than in the second group, had more plumose panicles and collateral filaments and these were more complex than in the usual dog, and in many ways the seeing-areas of the trained dogs were at least twenty-five times (an approximate, but low estimate) more complex structurally than in the usual dog.

It was impossible to completely deprive animals from the opportunity to hear sounds, but by depriving them as much as possible, and contrasting them with another group that had been made to practise hearing and discriminating sounds, it was found that the cortex in the hearing-areas of the trained dogs was more vascular, had a higher specific gravity, was thicker, and contained far more brain-cells, etc., than the cortex of those which had been partially deprived of sounds, and far more than the cortex of any usual dog. Experiments upon the senses of smell and taste confirmed the same results. Rabbits confined in monochromatic rooms, and thus compelled to see only one color of light from birth until death exhibited a chemically different cortex over the seeing-areas than rabbits which had been subjected to a different color—the cortices would stain differently with the same reagent.

I may mention here that I employed new technic in these examinations. My staining was done by cataphoresis, that is, the electric current was employed to carry chemicals into the tissues. The staining agent is carried into the brain-substance to be examined by the aid of the current from batteries, thus staining differently than when the reagent is used in the usual way. I also sent one stain into the tissues in one direction and then sent another chemical through in the opposite direction—the two reacting upon each other produced some very delicate staining, revealing structures not capable of being seen by other methods.

Another sample of the new technic is as follows: from a prism a monochromatic ray is reflected upon the slide containing the tissue to be examined—tissue that has been hardened, cleared, and stained in any of the usual ways or by cataphoresis—and some of the structures may absorb and some reflect this ray. If not reflected ano-

ther ray of a different pitch is tried until some result is obtained. These monochromatic rays bring into visibility different portions of the tissue—what is revealed by one color may be invisible under another colored ray. By sending upon the first monochromatic ray another ray of a different color the different structures rendered visible by the two rays may often simultaneously be viewed.

I also caused a dog to practise certain things with his right leg, and another dog, with his left leg, and found in the first case an unusual development of the left Rolandic leg-area, and in the second case an unusual development of the right Rolandic leg-area. In a case where the dog used both legs equally there was equal development of the two areas. One dog was prevented from doing walking from birth till death, and his brain compared with that of a dog that had followed a huckster wagon day after day from the fifth to the twelfth month—the difference between the leg-motor areas was enormous in all of the characteristics mentioned in case of the sight-educated and sight-deprived dogs.

One group of three dogs were caused to practise leg-motions in response to certain sounds; and another group of two dogs were caused to practise the same leg-motions but in response to colors. The cortical peculiarity was in the first case an unusual development of the fibre-tract between the leg-areas and the hearing-areas; and in the second case the fibre-tract between the leg-areas and the sight-areas was unusually developed.

These and many similar experiments confirmed me in the conclusion that the *modus operandi* of mind and brain-growth is this: every conscious experience of sufficient intensity and duration creates in some part of the brain special structural changes, both of a histological and chemical kind, and that the re-functioning of those structures constitutes memory. These last-mentioned experiments upon the fibre-tracts confirmed me in the conclusion otherwise arrived at, that the association between memories is accomplished by anatomical integration by means of fibres and plumose panicles and wave-motions in the brain-mass.

Every definite mental experience produces a definite anatomical and molecular structure in some part of the nervous system.

Each definite emotion produces a characteristic metabolism, and a definite memory structure: the evil emotions produce *cacastates*, and the good and agreeable emotions produce *eunastates*,—the former are life-destroying and the latter are life-augmenting. Right and wrong has a chemical basis and criterion.

This method of research, the results which I have attained by it, and an account of some of its applications, will soon be published in a book which I now have well under way, and hence I will close my present account of the method of research in psychological biology by saying that this method can be very much extended, and it promises splendid results in the whole domain of psychology —using psychology as inclusive of biology and every other science. All sciences can be properly studied as products of mentation, and not in any other way. All arts are the product of mentation and are applied by mentation; and all skill and work is mentation. Al knowledge is mentation, and all discovery is mentation. It is the mind that succeeds in scientific work—it is not so much a question of experiment, and of the phenomena observed, as of the mind that mentates the experiment and thinks about the phenomena; and in order to promote the development of a given science by a given mind it is infinitely more important to develop and properly *use that mind* than to experiment and observe. Experimenting, if properly done, is the most perfect kind of mentating, and the better the brain, the better the mentation.

Give to any group of animals of like age and species a definite training in the use of any one mental function (or group of functions), and to another similar group a definite training in some other one mental function (or group of functions), and then compare their brains, and learn the causative relation between mentation and structural growth—learn how it is that the phenomena called *life* are caused by mind. Compare the brains of the just-mentioned animals with the brains of other animals that have been deprived of the exercise of these same functions, and learn that in any part of the brain selected there can be builded structures according to a previously determined plan. *That* is brain-building. Future edu-

cational systems will be based upon brain-building, or mind-embodiment.

It is obvious that these structural changes can be made in any animal or human being in any part of the brain selected, or in reference to any function or group of functions, if these functionings are done taxically and systematically so as to uniformly reiterate each element of a complex group until the entire group has been embodied in structures, and to do this by presenting taxonomically related groups of experiences from each domain of nature and knowledge is to build a normal and efficient brain, whose functioning will surpass the mentation of a book-bred or school-drilled brain whose structures are ataxic and asymmetric.

The educational systems which will grow out of the principles of brain-building will leave no areas of the brain fallow, no cell-layers undeveloped, no departments of nature unstudied. The taxonomy of cosmos, and the natural relations of knowledges, and the natural laws of brain-growth will determine the subject-matter and method of coming school-curriculums. The given brain and mind of the pupil will become the guide for its own development, and subject-matter and method will be guided by the natural requirements of that mind. Not the text-book or the course of study will regulate the training, but the needs and nature of the particular brain of the pupil. Only by a study of the actual methods of brain-growth, as caused by mental activity creating brain-structures, can we hope to drop the present artificial and highly arbitrary educational customs and adopt a natural and normal method.

In this new method of research we have a direct way to ascertain the relations between mental action and mind-embodiment, and can thus obtain the unassailable data for the formulation of a natural and comprehensive education. One-sided trainings which leave some parts of the brain atrophied and others congested will be forever abandoned. Courses of instruction which pour into the mind disconnected elements of mentation from disconnected subjects and build up a partial, intellectual, atypic series of mind-embodiments without the complementary emotional embodiments will be abandoned. From all domains of nature and through every normal

channel of mentation will be exercised every class of mental activity in taxic groups, according to the brain-building laws, and the brain will be a harmoniously-working and efficient organism with all of its parts in due proportion, and evil memory-structures and immoral propensities fully eliminated. I call upon investigators everywhere to hasten to take advantage of these opportunities.

My appeal is that many workers may soon take up the scientific study of mentation and reap the rewards of these methods of research. The brain is the most wonderfully complex organism known to man, and it is a machine that can be used in the production of definite results, according to determinable and determined rules. The mind, by its own activity, can build and re-build this machine according to methods formulated out of the data offered by the method of psychologic research herein outlined. We know of mind only as manifested in the functioning of organic structures, and when we build a larger and better brain by the proper kind of taxic mental functioning we give to that person more mind.

Mentation is the directive and causative factor of organic evolution: and evolution is mind-embodiment. From the lowest to the highest organism, as the mind becomes more efficient and complex the brain-structures also become more complex. The goal of any evolutionary stage of any species of life is the degree of mind embodied. Can you conceive of progress which brings ever less and less mind? It follows that out of these researches grows not only a method of education, but a standard of conduct: that act which in its immediate or remote consequences causes the embodiment of more mind is right, wholly right, and there can be no other right; and that act which in its immediate and remote consequences causes less mind to be embodied is wrong, wholly wrong, and there can be no other wrong. This is not the place to discuss this proposition. Suffice it to say that by mind I mean the totality of adaptive functioning—I mean not merely intellectual acquisitions, but acquisitions of the corresponding emotive states and conative structures and the attainment of moral character—all of which are mental functionings. In these studies we are in the workshop of progress—we are studying the laws of the great motor of evolu-

tion—the cause and content of all knowledge and life—namely, mentation.

The modern age will not be known as the age of steam or the age of electricity, but the age of the apotheosis of mind; the age wherein the attention of mankind has been directed to the primary cause and fountain of all progress and power and suffering and happiness, namely, mind! The standpoint of science will be changed from that of a struggle with experiments and phenomena to a struggle with the mind that makes the experiments and observes the phenomena. There will not be less experimentation and observation, but more, and it will be by better minds. The arena upon which present science directs its undiverted eyes is that of objects and phenomena in the objective world, whilst the arena of the new standpoint is that of the pupil's own mind. Make a better brain and get a better mind and learn how to use it, and observation and experiment will teach something more to that mind than to the person who neglects the most important factor of any and all investigation—namely, the mind that makes it.

5. *Subjective psycho-biology* studies introspections as presented by nature and as varied by the pupil's own subjective efforts in order to learn what his or her own organism is. The new method of experimentation in this science consists in artificially varying introspective states and observing the effects of those definite and long-maintained states upon the organism and the environment. It requires a previous training in subjective bio-psychology so the pupil may be able to recognise and name and call into activity any given introspective state and maintain it for required lengths of time.

This method determines the relation between mental states and metabolisms and structures and environmental conditions. Each emotion produces a metabolism characteristic of that emotion, and every introspective state which the pupil can recognise and maintain, will, while thus maintained, produce definite structural effects and definite physiological and pathological results in the pupil's own organism which leads to formulation of the laws of organisms in the terms of mind. Introspective states affect metabolism, circulation, respiration, digestion, assimilation, excretion, secretion,

growth, sleep, wakefulness, strength, health, hearing, seeing, tasting, smelling, temperature and pressure senses, dreams, movements, complexion, voice, gesture, and the environment. The new method of scientific research in this domain, as before stated, consists in experimentally maintaining and suppressing introspections and studying the organic and environmental effects in order to formulate the laws of organisms, especially of the pupil's own organism—a knowledge that exceeds in importance that of all others to the pupil.

6. *Psychological sociology* studies the mental phenomena of groups of organisms or societies in order to determine *what* organisms are, and especially what groups of organisms are. It studies the mentations of groups of individuals and institutions and mobs and families and clans and sects and religions and social integrants as presented by nature and as varied experimentally in order to determine the effect of such group-mentations upon the individuals of the group, and upon the group, and upon the environment. It interprets social wholes in psychic terms.

The method of experimental research in this domain consists in artificially varying the mentations of groups of individuals and observing the corresponding changes in group-structure and in environment. From coherent masses of cells and groups of plants to human institutions the experimental scheme is to vary the adaptive functioning and observe and correlate the effect upon the group. Mind laws are applied to the study of societies in order to find out the laws of structure and environment in relation to groups.

These three psycho-biological sciences rest upon the discovery that by varying the mentation of an animal or group of animals we can vary the growth of visible, tangible, ponderable structures of an organism, and thus determine the causative connexion between mentation and living growth. Mind dawns before the view of the experimenter in this domain as a causative factor in life and evolution. If every action of an adaptive character is called mental, then the distinction between animate and inanimate masses or bodies, between living or "supposed" lifeless matter, is one of mind. If every adaptive action of an organism is mental, then mind is the efficient cause of evolution. If every adaptive act is the result of

sensibility or perception or volition or willing or impulse or desire or fear or craving, and so on, then it follows that adaptation is mental and evolution is mental. Our conception of an inanimate mass is that it cannot initiate an adaptive and responsive action. Our conception of an animate mass is one that can initiate an adaptive movement, molar or molecular (every molar motion being the result of a molecular motion in an organism).

The demonstration that mental activity creates structure places the matter of evolution largely in our hands to direct and augment it. We can select grouped activities according to the taxis of nature and mind, and build a grouped series of taxic structures in the brain, and thus embody more mind and thus anticipate centuries of haphazard, survival-of-the-fittest evolution, unaided. Henceforward man can take the Archimedean lever of progress in his own hands (or brains) by directly augmenting the fundamental cause of evolution and progress,—getting more mind, and learning how to utilise it. Mind is at once the cause and the end of progress—the method and the goal!

The chemist who desires to advance his science will spend less time and labor perfecting his apparatus and experiments, and far more time to the perfection of his mind as the instrument to use in making discoveries. The insight has changed from the objective to the subjective. It is a question not so much of the number of experiments he makes, and the number of compounds he studies, but of the amount of mind he has embodied and of the way he uses his mind thus embodied. By getting more mind through brain-building he will be able to understand phenomena and devise experiments before impossible to him. The centre of scientific effort will henceforward be the perfection and building of the scientist's own brain and the embodiment of more and better mind, with which to experiment and think.

7. The *Science of Mentation*, of which *psychology* as previously known is a subordinate department, is a synthesis of the generalisations of the preceding six experimental sciences, and proceeds upon such fundamental laws of mind as have been determined, and includes logic as portion of its subject-matter co-ordinate with all

other sciences as portions of the science of mentation. All philosophical and metaphysical systems, all religions, languages, and institutions and arts come within its scope, and furnish its subject-matter. Whatever the mind has done belongs to the science of mind. All that man has done upon earth, all that has resulted from the adaptive functionings of organisms, from the hole burrowed in the earth by the simplest worm to the pyramids of Egypt; from the silicious shell of a diatom to the Thirty-nine Articles; from the automatic metabolism of protoplasm to the prevision that results from the highest scientific generalisations; in short, all of the phenomena of life come directly within the scope of the science of mentation. All *knowledge*, having been produced by mind, and capable of being known only by mind, and can be applied as an art only by mind, comes under psychology as a subordinate branch. The science of mentation, which might be called psychonomy, offers data for an art of mentation. Corresponding to this mind-science there is a mind-art,—but of this I may speak in a subsequent article.

I will conclude by calling attention to the imperfections and complete inadequacies of all psychologic terminologies. So great is the diversity of meaning attached to all terms relating to mind that it is very difficult to make one's meaning clear to any great number of people, and it is even difficult to make a record of one's own thinking. The same word applies to such a number of distinct mental processes, and so many distinct mental functions have no name, that it is time to introduce some terminology free from these difficulties. In my own thinking and writing I use symbols instead of words, and the system has received the approval of some very high authorities. I append a brief description of part of this system of symbolic terminology, reserving a description of the taxonomic nomenclature for subsequent presentation.

Many cosmic forces may be incident upon the organism, but only those which excite an adaptive response, act as a stimulus: let such a cosmic stimulus be named or represented by the capital letter *A*.

This cosmic stimulus may be incident upon an organism but not be of sufficient intensity or duration to excite an adaptive re-

sponse, if so, it does not produce any impression recognised by the organism or responded to by any of its structural parts. But if of sufficient intensity and duration to produce such an impression upon any organ then it is called a sense-impression, and is represented by *B*.

Let the transformation of this sense-impression into transmissible energy be symbolised by *C*; and its transmission through a nerve by *D*; the impression made upon a ganglion by *E*; the transformative functioning in the ganglion by *F*; the libero-motor discharges from the ganglion by *G*; the new structures caused by the ganglionic functioning by *H*; the effect of the libero-motor discharge by *I*; the re-functioning of the *H*-structures by *J*; the libero-motor discharges of the re-functioning by *K*; the effects of *K* by *L*; the structures caused by the re-functioning of the *H*-structures by *M*; the libero-motor discharges of *M* by *N*.

This is not the full symbolism for the area gone over. Thus the libero-motor discharges of *G* are transmitted through a nerve, and in the full terminology this is named, so is the impression of that which is transmitted, and so is the effect on the tissue to which it is transmitted, and so on. My purpose is to give enough of the terminology to give an idea of its scope and importance.

Resuming again the system of naming from where I left off, let the transmission from the sense-organ or ganglion to other ganglia intermediate between the sense-organ and the cortex be represented by *O*, *O'*, *O''*, etc.; the transformation of the force for transmission by *P*; that which is transmitted by *Q*; the impression on the cortical cells by *R*; the functioning set up in these cells by *S*; the consciousness of that functioning by *T*; the structure formed by that functioning by *U*; the libero-motor discharges of that functioning by *V*; the effect of *V* by *W*; the refunctioning of *U* by *X*; the consciousness of that *U*-refunctioning by *Y*, and so on.

Special symbols indicate the kind of stimulus, whether of light, sound, smell, etc., and the higher grades of mentative integration and differentiation have symbols for names instead of words. This conduces to great exactness in description and in thinking. The functionings called sensation, imagination, conception, ideation,

reasoning, and so on, have each their appropriate symbology and taxonomy.

These new methods of research open wide fields of richest treasure to the investigator, and offer wonderful chances for co-operative mentation and research.

ELMER GATES.

PHILADELPHIA, PA.

LITERARY CORRESPONDENCE.

FRANCE.

Twenty years ago when M. le Comte d'Haussonville received M. Alexandre Dumas fils at the French Academy, the audience were surprised to find M. Dumas a trifle insignificant, in spite of his talents, and apparently unfortunate in having sought success in the criticism of the Chimène and Rodrigue of Corneille. The fine irony, the distinction of style, the justness of judgment displayed on this occasion, did not emanate from him. The man of the world, with his qualities of race and his experience of public affairs, won the victory over the professional writer in this pleasant academic bout.

Yesterday, again, the presentation of M. Albert Sorel afforded us a similar spectacle. At the outset a diplomat, M. Sorel is now a professor. To judge solely by his last discourse, philosophers will doubtless be of opinion that he is far from exhibiting the qualities which marked the work of M. Taine, his eminent predecessor. Besides, his rhetoric is a trifle apparent, and is redolent of the methods of the schools. With M. le duc de Broglie, it cannot be gainsaid, the judgments are more precise, the phrase is valued less for itself than for its substance. The language, both in the eulogy and in the criticism, is facile and measured. The statesman lifts us without effort to that elevated plane where, if it is not possible to grasp things individually under the best points of view, one at least obtains a better and more satisfactory survey of the whole. On this occasion again the statesman eclipsed the scholar, the man of the world the man of the study.

I could go back even to the *Correspondence* of Voltaire and

Frederick the Great, of which Sainte-Beuve remarked that of the two, Frederick showed not less *esprit* than Voltaire, while in many respects he was his superior. My object in these parallels is to depreciate neither literature nor scholarship. I am thinking merely, that we are too prone—at least in France—to restrict genius to the province of letters, and to confine the human intellect to a narrow field of action, in which it does not always completely express itself. Words are not all, and even literature is a trumpery matter, when unleavened by the breath of life. There have been admirable writers who were not authors by profession. The rules of our French Academy, therefore, in spite of the strictures they have evoked, were wise in calling to its assembly-halls, statesmen, soldiers, and even noblemen, who have not made a business of wielding the pen. The Academy, in this way, wins qualities and a prestige which would otherwise be lacking to it. One may foresee, without difficulty, on reading the discourse of M. le duc de Broglie, all of whose opinions, however, I do not share, that none of our recent academicians—as M. Brunetière or M. Jules Lemaître—is ever likely to speak in his manner.

Can it be said, now, that M. Taine has been fully appraised in these two discourses? I hardly think so. M. Sorel has not successfully grasped him ; he has displayed his dispersion only at the sacrifice of being dispersed himself. M. de Broglie has, beyond a doubt, comprehended him better, contrasting in the illustrious deceased the character of the artist with that of the philosopher, his imagination oftentimes extravagant, with his logic, which is often strained. It appears, in places, as if the figure of M. Taine emerged from these appreciations, diminished and dwarfed. His weakness, in my opinion, was an exaggerated anxiety about form, strengthened by his education at the Ecole Normale. He has given way more than once to the illusory ambition of accomplishing by words what was left unaccomplished by the thought and of illuminating by the light of words ideas without which the words are dark. I do not assert, of course, that the drapery does not conceal a robust body ; I merely reproach him with a certain labored virtuosity, which does not always stand his philosophy in good stead. He abhorred the lan-

guage of Comte, one of his philosophical masters, and perhaps did not love overmuch that of M. Guizot, who evoked in him the inspiration of the historian. Both, however, left signal works, which it has not been his destiny to rival.

Taine was above all a psychologist. His cardinal doctrine must be sought for in his work *De l'Intelligence*, which is his chief performance. He has exercised by this book a decisive influence on the French school for twenty-five years. His error,—and others have followed him in it,—is in my judgment his seeking in psychology the key to history, and his believing it possible to reduce sociology to a study of individuals or even of races.

"Fundamentally," he wrote to me, in a letter in 1883, on the subject of an article which had appeared in the Review edited by M. Littré, "the historical school to which I belong has extensive analogies with the positivist school of which you seem to be an adherent. I say 'fundamentally,' because if we take the social and political theories of Comte our conclusions are opposed. He did not love the details of history, nor psychological criticism, and these, in my opinion, are our only means of penetrating into the inner recesses of souls, and of observing individual and collective passions, which are the real causes of events." Taine set great store by a richly-stocked palette in his portraiture of events by their actors; but he was debarred by just this procedure from all explanation of their movement and real concatenation. He raised an auxiliary method to the rank of a constructive method.

The reader will be kind enough not to take my remarks for aught else than a testimony of my profound regard for an eminent mind. Discussion magnifies the living, continues the dead. Concerning this nice point of historical method, on which I have just touched, I have expressed myself at length in my last *Correspondence*. The brief lines of Taine which I have extracted from my papers, appear to me to show forth with remarkable distinctness the motive principle of his literary, historical, and social criticism. We know what has been added to it since, by M. Tarde and M. Le Bon. But with all that has been done, it by no means follows, that the opposite method is dead—which consists in deducing from the study

of large historical *ensembles* (a study which does not at all exclude details or psychological criticism) general laws of evolution which will enable us to predict events and will secure a sure foundation for practice.

* * *

M. Emile Durkheim, who presides over the department of sociology in the Faculté des Lettres at Bordeaux, publishes *Les règles de la méthode sociologique.*[1] He takes a stand in this work in opposition rather to M. Tarde and the psychological school than to the positivist school. What he really aims at is the remodelling and completion of the work of Comte and Spencer. He agrees with Comte on the one essential point, that society is a fact *sui generis* which transcends biology. The object of social science is said to be that new "thing" which results from association and which assumes, therefore, the character of a system of action common to, and imposed upon, all the members of a society. It will be necessary in the future to study it from without, without regard for its repercussions in the consciousness of the individual, or for individual modes of thought.

This, M. Durkheim tells us, is what Comte sought after. But he did not remain loyal to his own method. He saw in society a course of individual development, and thus, in spite of himself, let psychology have the last say. We revert by this road to the common error of thinking that the facts of society have value only in and through our ideas, which would then constitute the proper matter of sociology. In fact, Comte did, adds M. Durkheim, make the idea of progress the object of his sociology, defining social evolution by the idea he himself had of it. Now, without contesting the empirical worth of the "law of the three stages," it is legitimate, runs his conclusion, to say that the sociologist is not called upon to busy himself, as Comte did, with the direction of evolution, but has merely to seek out the definite causal relationship between antecedent phenomena and consequent phenomena.

Certainly, it would be unjust to assert that neither Comte nor

[1] F. Alcan, publisher.

Spencer had in view the explication of the present by the past. But in addition to Comte's limiting his attention to the study of the mental factor, he further committed, according to M. Durkheim, as Pascal did, the error of crowding humanity into a single line of growth, of representing progress as that of a single people, "to which all the consecutive modifications observed in diverse populations could be ideally referred." M. Durkheim has proposed, accordingly, as a means of avoiding this mistake, to discover what he calls *social species*, which shall serve as intermediary links between the confused multitude of historical societies and the simple but ideal concept of humanity. We should obtain, in such a way, if I understand the thought of the author, abstract morphological types, calculated to represent and symbolise the concrete types in all features that are essential; and by studying the concomitant variations of these types, in other words, by the employment of the comparative method, we should arrive at last at a scientific explanation of the phenomenon.

M. Durkheim has, in my judgment, entered on the only path that is likely to lead to the establishment of a sociology. The methods lauded by Taine and Tarde have proved incompetent. Not that M. Durkheim's thought is always clear, nor his exuberant dialectics without pitfalls. He gets entangled, for example, in the relations of "generality" with "normality," and in the pages where he treats of criminology he boggles at the explanation of a difficulty which is simply the outcome of his own definitions. He has reached a theory of the social utility of crime, a point on which M. Tarde will no doubt make short work of him. M. Durkheim might have spared himself these petty vexations, had he simply pointed out the causes which are calculated to augment criminality in a society in many respects apparently progressing, and had he avoided also attaching an absolute value to that rather lax expression, *inferior* or *superior* social types. He appears to have forgotten, in fine, that medical pathology affords an auxiliary discipline—as, for that matter, all psychology does—which can render material assistance in comprehending the facts of social pathology.

Unfortunately, M. Durkheim impoverishes sociology by his

attempt to delimit it. I must reproach him, particularly, with having miscomprehended, in his exaggerated fear of "subjectivism," which he throws up to Comte, the phenomenon, so evident in history, of the incorporation of grand intellectual states in every social fabric. Would it not be easy to show, for example, that the present constitution of France is in many respects the expression of the metaphysical mode of thought which triumphed with the French Revolution? The study of the fact of *property* is, truly enough, a different thing from the "psychology of the property-owner!" But how can M. Durkheim believe that the evolutionary drift of a period has such scant significance? Does not every "relation of causality" in the social scale imply at the same time the intervention of individuals (the passions of the parties interested, the motives of legislators, etc.) and a certain tendency, or orientation, of the event itself?

To consider the social phenomenon in its entirety, without arbitrarily eliminating any element of it; to distinguish in it grand classes of facts, economical, juridical, political, and intellectual; to study in each of these classes the more special facts, such as property, the family, marriage, religion, etc.; to examine how these different facts influence one another, how they become modified as a whole or successively; to seek out the individual modifications which they may present in the different familiar historical series, and to make allowance in all cases for the variations that are incident to race, geographical environment, etc.; to discover an evolutionary drift for particular facts and general classes of facts; to trace out a scheme of their correlative evolution which shall render prevision and practical action possible,—such seems to me to be the object of a system of sociology. It is clear that the comparative method is its means of procedure, and that all the aids offered by the other sciences are to be placed in its service.

* * *

In *La cité moderne, metaphysique de la sociologie*,[1] M. Jean Izoulet gives us the first volume of a large work treating of the "recon-

[1] F. Alcan, publisher.

ciliation of the religious soul with the scientific mind." In this aspect it will interest the readers of *The Monist* and *The Open Court.* In the present volume, M. Izoulet studies the question in its philosophical aspect; he proposes in the forthcoming parts to study it in its historical aspect (Christianity and the Revolution), and in its political aspect (the Church and the State). One is a little dismayed at the undue bulk of this book, which takes up nearly seven hundred pages, and could readily bear condensation. One must censure the author also for a certain obscurity of style, the indiscriminate use of italics, and a perpetual division of the text into paragraphs, which distract the eye and break the chain of reasoning. We shall observe, however, that he is a man of sincerity and ardent faith. The guiding thought of his work is to trace psychology and morals to biological conditions, to found a psychology and system of ethics which shall be "bio-social," such that man shall no longer be considered as an independent ego, individual or animal, but as a solid whole, a member of a "city" or community. Man *is* not but *becomes*—in æsthetics, morals, and in thought—according as he passes from animality to humanity. This idea is not new; it has been largely exploited by Spencer, who is also not its discoverer; it is a familiar conception to nearly all of us, and all of us have already made some application of it. M. Izoulet might have mentioned many precursors in his line of thought. His originality consists rather in the application which he has made of the principle of association to the study of philosophical problems; which must not be taken to mean that he has absolutely solved them.

Nothing could be better than to eliminate happiness and personal welfare from ethics. "*I! I!* That is the eternal shibboleth of mystical ethics. It will take a long time to accustom Western peoples to the bio-social conception, conformably to which that full expansion of energies which is life and felicity can be procured to individuals only in and by a just association. . . . *I! my* reward, for *myself*, here and now! But have a care, poor people, you are entangled in the cog-wheels of the social organisation. That insight will make you wise." Without doubt. But that old truth does not prevent individuals from being profoundly sensible of misery, each

on his own account; the collective consciousness does not abolish the individual consciousness, and, accordingly, the sacrifice of the individual in the interest of the whole, well grounded as it may be as a matter of reason, remains none the less painful as a matter of feeling.

M. Izoulet is desirous of reconciling the mechanism with the end. Man, he says, is not the geometrical centre of things; but he remains, nevertheless, the optical centre, and, judging by himself of all the rest, he discovers in all places meaning and finality. "Mechanism is the outward view; finalism is the inward view." At last, from the fusion of adverse doctrines we see emerge "finalistic monism or science pervaded with religion, or physics pervaded with metaphysics, or nature pervaded with God." True again. Nor is it a recent attempt of philosophy to integrate quality and quantity in the concept of the universe. But we shall never be able to do so except by an artifice of the mind; that artifice, necessary as it is, leaves remaining, nevertheless, the immediate awareness of the ego and the non-ego, and the very finality which we impose on things is at once contradicted by the mechanism which things impose on us. The strangest error of M. Izoulet is that he flatters himself he has avoided agnosticism by substituting the word *incomprehensible* for the word *unknowable*. He wants man to *see* what he does not *understand*. But that *incomprehensible*, that thing or phantom which escapes our grasp, does it not reduce philosophy to the very dualism which it sought to escape from by it? Is not this tantamount again to distinguishing between two different or heterogeneous species of "unknowable" things, and would it not be more correct to say that if all is *knowable*, what is always left is the *unknown*?

I might review thus several problems, and the same conclusion would be established everywhere, that the antinomies which they reveal can only be resolved by considering the terms as simple logical attitudes of the mind which has posited them. They are our way even of comprehending and feeling; they stand for the forms of our sensuous existence and understanding. The moment we transplant them without ourselves and hypostatise them, we create

a spiritualism, a materialism, an idealism, etc. But the criticism of these systems carries us back at once to the necessity of our nature, to our necessary mental condition; this it behooves us to know, to make precise—and finally to accept. Monism is that unification of phenomena which cloaks the unnoticed but inevitable artifice of the mind.

* * *

I wish to point out in closing a more modest work by the late M. ALFRED DUMESNIL,—*Libre.*[1] M. Dumesnil was neither a professional philosopher nor a professional writer. He passed his youth in the intimate society of illustrious men, and devoted the rest of his life to the culture of plants, to the "*culture sans terre*," which has been so much spoken of. He belonged to that fine group of men born under the Empire and the Restoration, which accounted as its friend Eugène Noel, who is still living, and the sweet and noble Jean Macé, who has just died. I am glad to say that I have enjoyed, although somewhat late, the friendship of these two last-mentioned men, who have both written such refined and charming works. M. Dumesnil, like them, had preserved that "superior sense of existence" of which no trace is left in our morbid literature. *Libre* is rather a collection of thoughts than a book. But the author has grouped his thoughts under the following characteristic titles: "Self-refuge," "The Support of the Individual," "The Consolations of Nature," "The Consciousness of Life," and "The Expansion of the Individual." The basis of his belief is spiritualism as properly understood, and the bent of his mind a species of stoicism which does not isolate the individual from humanity. M. Dumesnil adheres to the immortality of the soul, which he does not understand, however, in the strict religious sense. But that matters little if we do not share his particular faith. It suffices that his book reveals in every page an upright and sincere soul, and that we may gather here a veritable bouquet of thoughts and maxims which are among the very best.

PARIS. LUCIEN ARRÉAT.

---

[1] Lemerre, publisher, 1895.

CRITICISMS AND DISCUSSIONS.

"THE KEY TO THE RIDDLE OF THE UNIVERSE."

To the Editor of The Monist:

Herewith a brief reply to your criticisms of my Monadism, published in the last issue of *The Monist*. As you bring forward only one main "difficulty," I will confine myself to dealing with that, and with as little outlay of words as possible. I have nothing of leading importance to add to the condensed "case for" my doctrine of the individual ego, as elaborated in *The Riddle of the Universe*. And I find that I have in that work already anticipated all the relevant objections made by you and dealt with them in full. It would have proved more satisfactory to me had my treatment of them been attacked in your "disquisition."

I shall ignore the plea that Monadology is "antiquated." Your own Monism, if the mere antiquity of a doctrine were a sign that it should be abandoned, would be in a very bad plight indeed. But let that pass. The sole consideration of interest to the inquirer is, What can be said on behalf of these seemingly clashing standpoints on the lines of an inductive rationalism? But do they clash so hopelessly? I would observe here in passing that I do not, as any reader of my *Riddle of the Universe* (Part II, Chap. VII, "The Universal Subject" especially) will allow, seek to discredit Monism, or rather an *idealistic* Monism, altogether. I there urge that not *mere* Monism, but a *Monistic Monadology* is the system most true to empirical facts—the necessary foundations of all metaphysical thinking. The world-order as revealed to consciousness is no Unity, but a Unity-Plurality, and must be explained accordingly.

But to return to the ego-crux. In attacking "my" doctrine of the ego, Mr. Editor, you impeach not merely my monadism, but also the belief of a very formidable army of thinkers, who on other counts would oppose monadism tooth and nail. The doctrine that a subject or ego is presupposed by even our most ordinary perceptions is one held by Kant, Fichte, Schopenhauer, and many Hegelians and others who reject monadism outright. I attach scant value to mere authority, but it is desirable that this fact should be made clear. You are not assailing the distinctive features of monadism, but a doctrine confirmed by the inquiries of a most

remarkable succession of thinkers, European and Oriental alike. I do not think that I exaggerate when I affirm that there is no doctrine of philosophy which can muster a stronger body of supporters. It is true that these supporters differ, one set viewing the ego as individual (a monad), others as the universal reason, universal will, etc., etc., but they agree as to the necessity of positing it.[1] So far, then, your disquisition does not concern monadism, but the wider issue of the doctrine of a subject. Those who concede such a subject need not be monadists, and many, indeed, are among my most valued critics.

Have you really followed my arguments, Mr. Editor? You urge that I endow my ego with "a kind of substantial existence, which, however, in order to escape the absurdities of his materialistic procedure, he makes as small as possible, only preserving its indivisibility and individuality. The result is his belief in monads." Well, a criticism like this is calculated to make one despair of elucidating one's beliefs! Let me say at once that I have endowed the ego with no "material" existence at all, as any reader of my long chapter, "The Individual Ego or Subject," (pp. 263–268.) will readily perceive. On the contrary, I am idealist and hold that matter is only a general name and that the particular objects to which in last resort this said name refers us, are simply modes of consciousness. Of course, seeing that "material objects" constitute a large portion of the content of the ego *as unfolded*, it is quite accurate to hold (*Riddle*, p. 331) that the ego, *in so far as it is revealed in and as objects*, is material, extended, etc. But the ego is not merely the virtuality or ground of that portion of its content termed "material objects," it is *also* the ground of those other modes of consciousness which are commonly termed "immaterial." The ego, in fact, as revealed may be viewed as material or immaterial, according to the special phases of its content which are under our immediate survey. It is the microcosm in which are hung the entire domains of "mind" (will, emotions, intellect) and of the so-called independent external world. "Mind" and "world" are It in process of unfoldment or self-revelation. But in view of the fact that "mind" and "world" are after all only apparitional phases of consciousness, the idealist has the last word. The *fontal* subject is not to be identified with any one phase of its consciousness (extension, resistance, pain, hearing, etc., etc.), but must be viewed as the ground, virtuality, potentiality, source, of *all phases alike*, only being adequately revealed in and as the entire stream of experience.[2] I have shown (*Riddle*, p. 280 and elsewhere) why the subject discussed as *prius* must be viewed as spiritual, i. e., as metaconscious potentiality of that which, emergent in the duality of the phenomenal life, we call self-awareness or consciousness. *It is no surd.* This and much correlated doctrine I have endeavored to establish at length. So far from knowing nothing about our subjects, I hold that we know

---

[1] And I have shown elsewhere that Hume and others, while nominally repudiating it, resort to explanations of experience which are quite inconsistent with their repudiation.

[2] *Qua* this present phenomenal life. The possibilities of revelation are, of course, limitless.

directly nothing else whatever. Our entire perceptual and mental treasures are—the output of our own souls!

As space for me is a mode in which subjectivity unfolds, I cannot attempt the absurdity of measuring monads. And I do not. The monads are not in space, but space, on the contrary, is in the monads its evolvers. The fontal monads are best discussed as centres of subjective activity, self-conscious, conscious, infra-conscious, etc., etc. "Size" is a conception only relevant to aspects of the world which these idealist master-builders glass in themselves. This view, however, does not negative the theoretic possibility that an "infinite glance" might be competent to compare and "size" their self-manifestations to themselves as varied world-pageants. But that is quite another matter. It concerns not the fontal monads, but their manifestations.

Let me state that the argument for an ego to account for memory and "psychical continuity" is only one of the mines which I exploit. It would suffice to establish *the* ego, but not a monadic ego; such is the view of many modern idealists. But in regard, sir, to your criticism "psychical continuity is nothing but the preservation of form in the flux of metabolic changes taking place in a sentient organism," I must point out that I have anticipated a like objection as embodied in the theories of other writers. (*Riddle*, 275–6, and 272.) Still I find the expression "form" used by you singularly obscure. Form-preservation here might well stand as a synonym for the continuity of a subject, more especially as you yourself hold that *all objective activities viewed as things-in themselves are in truth subjective.* I need surely not urge here that the "rational explanation" of memory is just what I require, and that the old physiological "continuity-of-the-vital-conditions" argument as put forward by Lewes and others is ludicrously weak. The supposed "material particles" are by supposition *many* activities, and what I want explained is the way in which their effects are given as *interrelated* in my memory-consciousness, where they appear, not as "psychical atoms," but as aspects only of a *unitary* self-identical experience, which subordinates all to itself. *A*, *B*, *C*, *D*, etc., the effects of brain-action are by supposition mere vanishing points, if unrelated in a mirroring subject, monadic or other. *They are rather individua*LS ("psychical atoms") *than an individua*L. Kant, I may observe, is quite at one with me in rejecting the absurdity of building up a *self-identical* consciousness out of *manifold* vanishing points. To conclude a necessarily one-sided letter, "The dependence of man's intelligence on brain-function, i. e., on related minor monads, is, up to a certain point at any rate, obvious. But, metaphysically interpreted, this dependence merely means that a complex of cerebral activities is continually being duplicated in a central monad, which may, of course, very well react upon these activities in its turn. Man, in fine, stands in his own monad, . . . though the mode of unfolding of this monad is largely guided by the workings of minor monads. Idealism may meet physiological psychology on this platform, and greet her with a warm

caress." (*Riddle*, p. 322,) But a proper treatment of the problems suggested by your criticism would involve writing an essay, and I have already written too much.

E. Douglas Fawcett.

Winthorpe. Torquay, England.

IN DEFENCE OF TRUE MUSIC.

Having read Mr. Crozat Converse's article in your issue for April with great interest but without agreement, I am bold enough to make the following few remarks upon the same subject. I know that the theory of onomatopy in music has been held by many celebrated musicians, and of course it is conceivable that the music of their composing was truly the expression of their emotions, feelings, and sentiments, always supposing that those same emotions, feelings, and sentiments were different, not only in intensity but in kind, from those of the generality of their fellow mortals.

It was this that Robert Browning had in his mind when he put such words as these into the mouth of the Abbé Vogler:

> "All through my keys that gave their sound to a wish of my soul,
> All through my soul that praised as its wish flowed visibly forth,
> All through music and me! For think, had I painted the whole,
> Why there it had stood, to see, nor the process so wonder worth,
> Had I written the same, made verse—still effect proceeds from cause,
> Ye know why the forms are fair, ye hear how the tale is told,
> It is all triumphant art. . . .
> But here is the finger of God, a flash of the will that can;
> Existent behind all laws that made them, and lo, they are. . . .
> God hath a few of us whom He whispers in the ear,
> The rest may reason and welcome, 'tis we musicians know."

Although this great musician believed music to be a language, it was a language that could be understood only by the composer, a sort of conversation between God and the musician, which was as little understood by the listener as a conversation carried on in Greek would be to a man ignorant of that language. Would not this be narrowing to a dangerous degree the usefulness of the most beloved of the arts? The musician, alone in his chamber, is composing harmonies which are destined to thrill the hearts of thousands and thousands of his fellow beings, separated from him by station, education, country, and kin; the sympathies of the musician and his listeners may be as far apart, as the East is from the West, on all subjects of importance, yet on one, and on one only, they can join issue—on that of sweet sounds. This would scarcely be the case if the music was nothing else than the expression of that musician's feelings on the subjects of love and hate, fear and desire.

To say that we find an interpretation of our sentiments and feelings in music is not sufficient to prove that we invented, as a language of feelings and emotions, those same heart-stirring, soul-subduing, miracle-working strains. Moreover, what

we call music, and in which sense only it seems to be understood by Mr. Crozat Converse, should more properly be called Harmony. All sweet sound is music, whereas harmony is an arbitrary arrangement of chords as found in the diatonic scale, with sixteen vibrations to the second for its lowest musical note and two thousand for its highest.

All the music of the Greeks and Orientals, the music of animate and inanimate nature, is enharmonic and has nothing in connexion with our system of chords but is not the less music on that account, and although it is possible to reproduce on the piano the songs of the nightingale, the lark, and many other birds, or to imitate the roar of thunder, or the falling of water, such imitation is weak and unworthy of the great powers of true music; the result, although fairly correct as to sound,—not, however, altogether so, for we have no musical note low enough to correspond to the roar of thunder,—is feeble and unreal when compared with the natural sounds of nature. I do not think that the united voice of mankind would allow us to say that there was no music in the voices of nature, nor would it allow us to say that this music had any exact meaning for them, or that any feelings other than simple admiration for beauty in sound were roused in them by listening to it. Though it may not be possible to analyse our feelings when we listen to the fall of the rain on a warm spring evening, and as it ceases its gentle drip, we hear the voice of a blackbird arising from the adjoining coppice; or again, on a dewy summer's morning as the sun rises a lark springs from the grass at our feet and soaring into the sky pours forth its entrancing tones; yet such sounds have brought tears of surprise and gratitude to our eyes, and have called forth tributes of praise from some of our greatest poets, to quote one only, Shelley's immortal song "To the Skylark."

"Teach us, sprite or bird,
What sweet thoughts are thine.
  I have never heard
Praise of love and wine
That panted forth a flood of rapture so divine.

"Chorus hymeneal,
Or triumphant chant,
  Matched with thine would be all
But an empty vaunt,—
A thing wherein we feel there is some hidden want.

"Better than all measures
Of delight and sound,
  Better than all treasures
That in books are found,
Thy skill to poet were, thou scorner of the ground."

No meaning, in the strict sense of the word, is conveyed to us, even to the poet, by those delicious sounds. If, then, that natural music suggests nothing definite, why should we hope to extract exact thoughts from music heard in conformity

with the diatonic scale? Harmony is an art, and, like the rest of the arts, loses its artistic value when pressed to serve ends other than its own.

Mr. Crozat Converse says of Beethoven, Wagner, and Berlioz, "the more those tone-masters' works are studied, in an onomatopic regard, the more do these masters seem to tacitly confess their being hindered in the use of tonal onomatopy by the imperfections in, and limitations of, the present system of musical notation," there is no doubt that the restrictions and limitations of the diatonic scale are great, for instance, there are a hundred different shades of tone between any two adjoining notes on the piano all of which are lost to the pianist. The music of the Orientals is enharmonic and in consequence is better able to imitate the music of nature than is ours.

There was an excuse for the Greeks being imitators of nature, because to them the murmur of water was the voice of a river-god, the rustling of the leaves in the forest the voice of Pan, and the sighing of the reeds and rushes the song of the Syrinx. They were pantheists, and their music was employed in the noblest way possible in imitating the voices of their gods, who dwelt in Nature's phenomena.

Surely, for us music has a higher function to perform than that of mere imitation, or of giving an expression to our emotions, but apparently Mr. Crozat Converse does not think so; he speaks of "the dominance of the principles of imitation which reaches beyond analogy." Why should pure music be an imitation of anything? Pliable as the music of the Orientals may be, they have never approached us in realisation of the ideal in music. They have spent their endeavors in imitation, in mere repetition of the natural sounds around them. From a like fate happily our composers have escaped, thanks to the restrictions of our musical system. Haydn, in his oratorio, "The Creation," has approached the nearest to a perfect imitation of a natural phenomenon, referring to that bar which Dr. Paul Carus also mentions in his "Significance of Music," in which the creation of light is described. Crowest writes: "Here by his sudden and masterly recourse to the refulgent harmony of the major tonic of the key, Haydn has succeeded in producing one of the grandest effects [considered, I presume, in an onomatopic light] of which the musical art can boast."

But who can read without sorrow of the manner in which Haydn is reported to have overcome the onomatopic difficulties connected with the tempest music in his opera, "The Devil on Two Sticks."

The descriptive onomatopic style of music has been, with but few exceptions, so unsuccessful, that there is little to prove the theory true. The difficulty of explaining Wagner's grand and heart-stirring strains by the theory of onomatopy was seemingly too great for Mr. Crozat Converse, for he says: "I think we may safely assign such tonal effects as we cannot under the present conclusions of musical science trace to its influence—for example, Wagner's dream-sounds—to the realm of unconscious onomatopy." That is one way of avoiding a difficulty. I would rather assign all that wonderfully powerful music of Wagner's to Socrates's theory of pre-

existence, and say that the strains he heard in other spheres haunted his memory and flowed out through his finger-tips, or to call him "God-inspired and glad," rather than to seek to find the key in his own powers of unconscious imitation.

If music is only an imitative expression of the sentiments and feelings of mankind, then the theory of tonal onomatopy is correct, and music loses her high place amongst the arts; but if, on the other hand, music is a separate reality, eternal with the eternal, as real as are those sentiments and feelings of which she is made only an expression, then the theory falls through, and we may still worship the muse as a sublime, eternal power, an expression, if we care to call it so, of the Eternal God.

EMILIA DIGBY.

TICEHURST, SUSSEX, ENGLAND.

BOOK REVIEWS.

THE FOUNDATIONS OF BELIEF. By the *Rt. Hon. Arthur James Balfour*. New York and London: Longmans, Green, & Co. 1895. Pages, 366.

There is perhaps no book of recent date that has been more misunderstood than Mr. Balfour's *Foundations of Belief*. It has been claimed by dogmatic theologians as a defence of dogmatism and reviewers have placed it on a line with M. Brunetière's *Bankruptcy of Science*, while freethinkers have denounced it as anti-progressive, illiberal, and hostile to science. The truth is that Mr. Balfour is a calm and considerate thinker who impartially delineates the present religious condition with little, if any, personal admixture of prejudice.

The first impression of the book appears to justify the prevalent notion that Mr. Balfour employs the logic of Mill in corroboration of Calvin's view: for it is true that Mr. Balfour rejects what he calls the scientific world-conception. He opposes naturalism; he dwells on the insufficiency of reason, and makes "authority" the supreme power which rules over all, regulating the conduct of individuals and swaying the fate of nations. Mr. Balfour's language, especially his use of the terms "science" and "reason," give unavoidably the impression that he is anti-scientific and anti-rationalistic, and it would seem as if our own position, the position of *The Monist* and *The Open Court*, which propounds a religion of science, could find no more antagonistic adversary than the author of *The Foundations of Belief*.

The book has no index, which makes a cursory glance at its contents impossible. It is in this respect like German books, which must either be left alone or read through, if misconceptions are to be avoided. The prominence of the author and the great sensation which the book created, is, however, a sufficient inducement to read the book through, and we are astonished to find that all the reviews that ever came to our hands have mistaken the spirit of its author. There is more agreement, even in the very letter, between Mr. Balfour's position and our own than could be anticipated of a work whose main subject is a denunciation of the narrowness and insufficiency of the scientific world-conception.

We must consider that when Mr. Balfour speaks of science he means that pseudo-science which at present boastfully and noisily assumes all the pretensions that genuine science alone is entitled to. Mr. Balfour's criticisms of science are the

very same strictures which we have again and again made on pseudo-science. He denounces "the naturalistic view that free-will is an absurdity," saying that "the sense of constraint and inevitableness would be as embarrassing to a savage in the act of choice as it would to his more cultivated descendant." Yet he admits that "there is nothing in the theory of determinism which need modify the substance of the moral law." This reminds us of our own position, for we uphold most emphatically the freedom of will, viz., the freedom of choice or the theory that our actions are our own and that through them more than through external conditions our future is moulded. We distinguish between Fatalism and Determinism. Determinism is the theory that everything is determined, both by physical conditions and by the free acts of aspiring beings. Fatalism is the theory that there is no freedom of will, and that whatever a man might choose to do his actions as well as his fate are inevitable. There is room for freedom of will in determinism, as we define it, but not in fatalism.

Mr. Balfour further objects to the ethical theory that the greatest happiness of the greatest number is the right end of action. Here again our agreement is remarkable. We have lost no opportunity of denouncing hedonism, not only as misleading but as fundamentally untrue. The reviewer has condensed his views on the subject in a little tale entitled "The Philosopher's Martyrdom," which is a *reductio ad absurdum* of the Spencerian ethics. The truth is that duty has nothing to do with sentiment; and ethics cannot be established upon the individualistic principle which assumes that death is an absolute finality, or, to use Mr. Balfour's words "refuses to admit that the deeds done and the character formed in this life can flow over into another." We cannot in ethics dispense with the problems of the whence and whither of the human soul. Without them we should have worldly prudence only but no ethics. Indeed, we may say that ethical action is precisely such action as is governed by the consideration of what will be when the present life has come to a close.

As to æsthetics, Mr. Balfour says that "Mr. Spencer's theory, like all others which endeavor to trace back the pleasure-giving qualities of art to some simple and original association, slurs over the real difficulties of the problem." Mr. Spencer characterises art as "a useless and superfluous exercise of human faculties." Because he finds that it originates from the *Spieltrieb* as Schiller calls it, he identifies it with sport and imagines that the higher arts are distinguished from the lower ones by complexity. This, our verdict of the Spencerian art conception, is very similar to Mr. Balfour's.

We have criticised (in *The Soul of Man*, pp. 9–14) Professor Clifford's proposition that the rational originates from the non-rational, and have again and again called attention to the fact that man's reason is the reflected image of the World-Logos, and that the cosmic order is the prototype of man's reason; it is the standard by which we measure the rationality of reason. If a man's reason agrees with those features of reality which make of the world an orderly whole, his arguments will be

correct. Wherever they are in contradiction man will go astray. In other words, the nature of man's reason is not subjectivity but objectivity. Reason is not a product of man's intellect, it is not merely ideal; but man's intellect is a product of that cosmic order which St. John calls the Logos that was in the beginning, it is objective and real. Mr. Balfour's views are here again in close accord with our own. He says: "If the world is not made by Reason, Reason is at all events made by the world;" but he rejects "the non-rational origin of reason" which, as he says, "is a necessary corollary of the naturalistic scheme."

Our agnostic friends in England and America have often criticised our position as being unfair to agnosticism, and our rejection of Mr. Spencer's conception of the first principles as being unknowable is well known. We are glad to see that Mr. Balfour when speaking on the philosophic basis of naturalism finds the same fault which we discover in agnosticism. He quotes Locke that he "suspects that natural philosophy is not capable of being made a science." and adds, "that this remarkable display of philosophic resignation in the father of modern empiricism has been imitated by a long line of distinguished successors." The basis of naturalism is experience, but what these experiences are is not clearly defined by empiricists; nor does Mr. Balfour enter into the problem.

In the third part of the book Mr. Balfour grapples with the problem of "Authority," which, in contrast to Reason, he calls "a group of non-rational causes." The word "non-rational" and the opposition of Authority to Reason have been a source of many misunderstandings. However, a careful reading of these chapters shows that Mr. Balfour understands by Reason the argumentative faculty of an individual man with all its shortcomings and liabilities to error. By Authority he means what we called above the World-Logos, and here our agreement with Mr. Balfour is as pronounced as in all previous instances. But while Mr. Balfour speaks of this Authority that dominates over us as being God, we have inversely defined God as "the Authority of moral conduct." The difference certainly is not great in spite of this inversion, and, in order to show how little antiquated dogmatism or anti-scientific notions are embodied in Mr. Balfour's conception of Authority, we quote what he says about "this group of influences" (sic!) which in one word he calls Authority. He says (p. 201): "They presuppose, to begin with, "the beliefs of perception, memory, and expectation in their elementary shape; and "they also imply the existence of an organism fitted for their hospitable reception by "ages of ancestral preparation. But these conditions, though necessary, are clearly "not enough; the appropriate environment has also to be provided. And though I "shall not attempt to analyse with the least approach to completeness the elements "of which that environment consists, yet it contains one group of causes so impor-"tant in their collective operation, and yet in popular discourse so often misrepre-"sented, that a detailed notice of it seems desirable."

This is Mr. Balfour's "Authority," which "moulds our feelings, our aspirations, and, what we are more immediately concerned with, our beliefs." And he

adds: "It is from Authority that Reason itself draws its most important premises." Mr. Balfour calls Authority non-rational because he finds it operative as an unconscious power previous to the origin of conscious reasoning. He says: "To Reason "is largely due the growth of new and the sifting of old knowledge. By Reason "also is directed or misdirected the public policy of communities within the narrow "limits of deviation permitted by accepted custom and tradition."

One main mistake of naturalism to which Mr. Balfour calls attention is the "unbalanced consideration of the vastness of Nature." The God of many naturalists is conceived "as moved by the mass of His own works, as lost in spaces of His own creation. He sets store by the number of square miles His creatures inhabit or the foot-pounds of energy they are capable of developing." "But," adds Mr. Balfour, "the magnitude and complexity of the natural world should indeed have no bearing on our conception of God's relation either to us or to it."

So far, we have to recount a number of remarkable agreements between Mr. Balfour's *Foundation of Belief*, which are based upon a consideration of the insufficiency of science, and our own view, which is the Religion of Science. If Mr. Balfour indeed represents the dogmatic church of Christianity, we feel more than ever confident that in genuine science agreement is not only possible, but will actually in the end be accomplished.

We cannot say that Mr. Balfour's book contains a solution of the religious problem. He has not attempted in it to work out a consistent philosophy of religion, and traces of a dualistic, nay, even of an agnostic, conception are visible in many passages.

Mr. Balfour's dualism is most apparent in the first chapter of the third part, "Causes of Experience," where he divides the realm of our mental aspirations into two disparate halves, "the natural world and the spiritual world, the world which "is immediately subject to causation, and the world which is immediately subject "to God." He continues: "The laws of the natural world are revealed to us "by the discoveries of science, while the laws of the spiritual world are revealed "to us through the authority of spiritual intuitions, inspired witnesses, or divinely "guided institutions. And the two regions of knowledge lie side by side, contiguous "but not connected, like empires of different race and language which own no com-"mon jurisdiction nor hold any intercourse with each other, except along a dis-"puted and wavering frontier where no superior power exists to settle their quar-"rels or determine their respective limits" (p. 194). It would lead us too far here to outline our position, which changes this Dualism into a higher Monism in which causation is no longer opposed to God, but is traceable also in spiritual intuitions, inspired witnesses, and divine institutions. We recognise in causation a part and parcel of that power which Mr. Balfour calls Authority. There is not only contiguity, but the most intimate connexion. There are differences of lower and higher ranges of nature, but the divinity of nature lies hidden even in its very elements. The World-Logos, being eternal, was in the beginning, and extends also into the in-

finitely small; there is no atom bare of that divine guidance which in its most salient actions scientists formulate in the law of causation.

Mr. Balfour's agnosticism appears in his strictures on Mr. Spencer's belief in the unknowable, from the depths of which, Mr. Balfour says, "should emerge the certitudes of religion." Here he agrees better with Mr. Spencer than he is himself aware of, and Mr. Spencer does not fail to call attention to the fact in his reply which appeared in the latest *Fortnightly Review*. We add that religion nowhere rises from the unknown or unknowable, for what does the savage or civilised man care about a thing or God of whom he can know nothing? The savage worships the thunder-god, *not* because he does *not* know the nature of lightning, but because he does know the obvious dangers connected with it; he is afraid of it. In the same way man began to be afraid of the curse of sin, which the moral teachers of men, preachers and prophets, pointed out to him. If we base religion on agnosticism, if we let it rise from our ignorance, religious truth will ever remain a blank for us, which we can fill out with our imagination; and ethics becomes a matter of taste. Morality, in fact, is, according to Mr. Spencer, that which pleases the majority of mankind. However, if we base religion upon the experiences of mankind, we shall discover the spiritual needs of man, the needs for strengthening his character in temptation, for guidance in the intricacies of life, for comfort in affliction. We shall discover that the power that punishes crime is as real as gravitation, and that its authority is ultimately identical with the authority of Science and Reason.

The gravest mistake of Mr. Balfour's book, in our opinion, is the misapplication of the name "science." By honoring pseudo-science with the name of science he seems to imply that there is no way out of the fashionable errors of a number of scientists, except by opposing to science the authority of antiquated church traditions, which should be accepted without criticism, and in this sense, indeed, Mr. Balfour's book is commonly understood. We are happy to state that this is a mistake, and can say so on the best authority,—Mr. Balfour himself. While he condemns the theories that commonly go by the name of science, he entirely accepts the proposition that "genuine science is divine," and we only wish that to forestall misconceptions, he had said so in his book. Nor does Mr. Balfour anywhere oppose "Authority to Science," much less does he think that "Reason is ungodly." He would not deny that in all probability his views are not so wide apart from those of the editorial position of *The Monist*, as may seem at first sight.

Mr. Balfour says on page 83; "I am not aware that any one has as yet endeavored to construct the catechism of the future purged of every element drawn from any other source than the naturalistic creed. It is greatly to be desired that this task should be undertaken in an impartial spirit." We submit that we have written a Catechism of Naturalism, which appeared in *The Open Court*, under the title "A Catechism of the Religion of Science," and has been republished in pamphlet form under the title *The Religion of Science*. But we have to add that the

propositions of our conception of Naturalism are almost throughout contrary to the propositions of Naturalism as criticised by Mr. Balfour.

It would be an interesting task to compare Mr. Balfour's propositions offered in criticism of science with those which we have made in the name of science. In spite of a radical difference in our methods of attacking the problem, there is a coincidence in detail which is remarkable and would be curious if it were not conditioned by a deeper connexion, which proves that on whatever radius we may advance in our search for the centre of the circle, we shall at last meet in one and the same point.

We regret that Mr. Balfour, in discussing the basic ideas of religion, did not enter into one problem, which after all will prove to be the problem of all problems. I mean the problem of personality, which is closely connected and even in some respects identical with that other great problem, the nature of God. It is probable that Mr. Balfour omitted these questions on good purpose, because they would have involved him in intricate investigations; but we hope that he will find leisure for another book, in which he will give us his views on the nature of man's soul. P. C.

STORY OF THE LIFE OF JESUS. For the Young. Told from an Ethical Standpoint. By *W. L. Sheldon.* Philadelphia: S. Burns Weston. 1895. Pages, 148.

AS OTHERS SAW HIM. A Retrospect. A. D. 54. Boston and New York: Houghton, Mifflin, and Company. 1895. Pages, 217.

Christ is a living power in the world, for the Christ-idea constitutes one of the most potent factors of our civilisation. No one, therefore, whose labors lie in the field of public morals can afford to avoid the question "What do you think of Christ?" The unbeliever not less than the believer must take issue and solve the problem, each one to his own satisfaction, before he can think of pursuing his course in life with consistency.

The two books before us offer two replies, both given by men who refuse to recognise in Christ a supernatural revelation, but while the one, destined for the use of children in the Ethical Sunday schools, omits every allusion to theology and changes Jesus into an ethical teacher after the fashion of the Societies for Ethical Culture, the other uses the Christian traditions without either endorsing a belief in the supernatural mission of Christ or introducing into the narrative the properly miraculous as actual facts.

The story of the life of Jesus by W. L. Sheldon is a long-winded recapitulation of the gospel reports with every allusion to God, angels, miracles, and immortality left out. Thus, when the shepherds were in the fields, Mr. Sheldon says, "It "seemed as if there were a choir of voices singing all about them in the darkness, "pouring forth words of beauty, so sweet that at first the men could not under-"stand them. Yet as they listened, it was as if amid the music they kept hearing

"one refrain. It came to them over and over again, the beautiful words: *peace on "earth, good-will to men.*" The "Glory to God in the Highest" is dropped as too theological, the purpose of the book being "not to awaken in the minds of the young any questions about problems of theology" nor to make any "attempt to antagonise it." This plan has been carried out and it is painful to observe how stale and unprofitable the story of Jesus grows by this treatment. Mr. Sheldon's solution of the problem is apparently wrong. A non-theological edition of the Gospels *ad usum Delphini*, will not be helpful to the children; for it conceals instead of explaining, and by concealing it misrepresents; nay, worse than that, it mystifies. The non-committal policy which neither endorses nor antagonises and leaves a blank is wrong.

The book, *As Others Saw Him*, is anonymous. Whoever the author may be, he shows a rare knowledge of all the Christian and Jewish traditions. And his knowledge is not mere scholarship; it has become alive by the touch of the poet's wand. We see Jesus before us as an actor in the great drama which ended with his tragic death.

The plot of the book is as simple as it is exquisite, and no historical novel-writer has as yet succeeded in producing in a few lines so grand an effect. Our anonymous author does not speak at all himself; he presents the story in the shape of a letter written by Meshullam Ben Zadok, a scribe of the Jews at Alexandria, to his friend Aglaophonos, a Greek physician of Corinth. This letter is a reply to an inquiry concerning Saul of Tarsus, who had created a great excitement in Corinth, and also concerning Jesus the Nazarene of whom Saul said "that he was a God like Apollo, that had come down on earth for a while to live his life among men." We learn by implication that years ago Meshullam lived in Jerusalem and that at that time Aglaophonos had visited the holy city and was entertained in the house of Meshullam, the scribe. Concerning Saul, Meshullam's reply is cool; his words imply even a warning against the man on account of his unsettled character and inconsiderate rashness.

Meshullam, alluding to the martyrdom of Stephanos, writes of Saul: "He is "well instructed in our law . . . yet he is not of the disciples of Aaron that love "peace; for when I last heard of him he was among the leaders of a riot in which "a man was slain. And now I think thereon, I am almost certain that the slain "man was of the followers of Jesus the Nazarene, and this Saul was among the "bitterest against them. . . . Truly, men's minds are as the wind that bloweth "hither and thither."

Meshullam continues: "But as for that Jesus of Nazara, I can tell thee much "if not all. For I was at Jerusalem all the time he passed for a leader of men up "to his shameful death. At first I admired him for his greatness of soul and good-"ness of life, but in the end I came to see that he was a danger to our nation, and, "though unwillingly, I was of those who voted for his death in the Council of "Twenty-Three. Yet I cannot tell thee all I know in the compass of a letter, so I

"have written it at large for thee, and it will be delivered unto thee even with this "letter."

The book *As Others Saw Him* is this description of events by the Scribe Meshullam who hesitatingly and regrettingly voted for Jesus's death. There are sixteen chapters, all full of life and action, and explaining the various situations to the Greek physician who knows little of the Jewish parties and Jewish customs. Thus the book supplies in the shape of novelistic fiction a commentary on the New Testament. The author introduces playfully all the light which the Talmud and also apocryphal traditions throw upon the accounts of the canonical Gospels. Delitsch, the famous Old Testament scholar and author of *Ein Tag in Capernaum*, could not have done better. Here we understand how and why the same people who welcomed Jesus with shouts of Hosanna could, after a few days, vociferously demand his execution. If the book is written by a Christian and a believer, it is a masterpiece of poetical imagination ; for it exhibits the grandeur of Christ's picture in its reflexion from the soul of a noble Jew, who, considering all in all, offers from his Jewish standpoint good reasons for rejecting Jesus. If, however, the book is written by a Jew, which is the more probable solution of its anonymous appearance, we should say that it has been written with the heart-blood of the author who finds himself unable to accept Jesus as the Jewish Messiah, and yet adopts the motto : "It cannot be that a prophet perish out of Jerusalem."

The tone of the book is noble and elevating, the whole conception is poetical, and its expositions are very instructive without showing the least tinge of pedantry. *Non olet lucernam.* P. C.

GENETIC PHILOSOPHY. By *David Jayne Hill.* New York and London : Macmillan & Co. 1893. Pages, 382. Price, $1.75.

The author begins with an examination of the general protest against philosophy in its old sense as ontology, and poses the question whether this discipline may not be rehabilitated in a more modern form, as a synthesis of the results of positive inquiry, which, in reality, aims to reach practically the same goal, but by a different method. That method, which the author briefly but precisely traces in the developmental process of science, he has stated in contrast to the ontological formulations of the problem as follows :

"Being, as apprehended by our intelligence, is found to possess continuity, and "all facts are the aspects of a process. When, therefore, facts are translated into "thought, they must not be sundered and isolated, floated off from their attach- "ments and treated as independent entities. The continuity which connects them as "real must also connect them as ideal. In other words, they must be genetically "regarded, or considered as aspects of a continuous process to which they must be "referred. *The genetic method, then, consists in referring every fact to its place in "the series to which it belongs.*"

The goal of the genetic method is stated as follows :

"The genetic method does not aim at a complete individual synthesis. Under "its guidance, contemporary philosophy should not attempt the reformulation of "all knowledge. Its function is that of an intellectual clearing-house, to borrow a "figure from the commercial world. The business of the philosopher is to equate "the deposits and indicate the deficits of the special sciences. This is an office "which many can perform better than a few, and thus philosophy as well as sci- "ence may be made social and co-operative, although it will always remain true "that philosophy in the active sense is not every man's business."

Conformably to the method prescribed, President Hill takes up successively in the ten chapters of his book the genesis of Matter, Life, Consciousness, Feeling, Thought, Will, Art, Morality, Religion, and Science. He presents and elaborates in a vigorous and graphic style the newest results and theories which bear on these various questions, and although the cultivators of certain branches of metaphysics will receive the impression that President Hill has slighted some important aspects of philosophy which in themselves are justly entitled to the rank of a scientific discipline, it must be remembered that he restricts the designation "philosophy" to individual attempts "to solve the central problems of knowing and being." Upon the whole his estimates are just and practical.

We are not inclined to accept, to their full extent, the introductory remarks of the author on the general character and methods of "philosophy," however pertinent they may be to certain systems and epochs; nevertheless, the book may be characterised as a good synoptic introduction into the new synthetic philosophy of science. T. J. McC.

LOGIC. By *Dr. Christoph Sigwart*, Professor of Philosophy at the University of Tübingen. Translated by *Helen Dendy*. London: Swan Sonnenschein & Co. New York: Macmillan & Co. 1895. Two Volumes. Price, $5.50. Pp. Vol. I, 403. Pp., Vol. II, 592.

We may refer our readers for a detailed analysis of Professor Sigwart's views of logic to the review which we gave of the second edition of the German work in the July, 1894, *Monist*, page 614, and to No. 107 of *The Open Court*, 1889. It would be entirely supererogatory to say anything about the position which Professor Sigwart's work holds in this department of inquiry, or to emphasise its importance as a text-book and compendium of the subject. Both are recognised, and the translatress, by her careful work, and the publishers, by the splendid form in which they have produced the volumes, have rendered an important service to the English-speaking public. In a brief Preface to the English translation the author acknowledges his great indebtedness to English logicians, and trusts that for this reason his book will not appear to English readers entirely as a foreigner. He has also a brief word to say on the almost insuperable difficulties attending the translation of a philosophical treatise, and assures us on the ground of his own careful revision that the translation is completely free from misunderstandings, and that it represents every-

where as exactly as possible the original text. So far as we have been able to see his confidence is justified, although, drawing its material, as the work does, from so many special sciences, one can scarcely imagine a book in which the liability to mistakes is greater.[1] The second volume is supplied with a good index of subjects, to which an index of names might have been added. *A propos* of difficulties of translation, it would be an excellent practice, and no inconsiderable aid to future workers, if the translators of philosophical works would always add a glossary of the German terms for which we have no exact English equivalents and of which the translations vary, together with the renderings which they have adopted in each special case. The work belongs to the *Library of Philosophy*, edited by J. H. Muirhead. *μ.*

COMTE, MILL, AND SPENCER. AN OUTLINE OF PHILOSOPHY. By *John Watson, LL.D.* Glasgow: James Maclehose & Sons. New York: Macmillan & Co. 1895. Pages, 302. Price, $1.75.

There is a great danger just now, the author thinks, "that philosophy, in the large sense in which it was understood by Plato and Aristotle, should be lost in artificial divisions and in a mass of empirical detail." He has accordingly sought to indicate by the sub-title of his little work that he aims to present the fundamental elements of philosophy as a scientific discipline. In other words, he has sought to be "at once critical and constructive." His philosophical creed, which he denominates Intellectual Idealism, is "the doctrine that we are capable of knowing reality as it actually is, and that reality when so known is absolutely rational." The method by which he has attempted to enforce his views is "to show that the ideas "which lie at the basis of mathematics, physics, biology, psychology and ethics, "religion and art, are related to each other as developing forms or phases of one "idea—the idea of self-conscious reason. But, partly out of respect for their emi- "nence, and partly as a means of orientation, both for myself and for the students "under my charge (for whom this Outline was originally prepared), I have examined "certain views of Comte, Mill, and Spencer—and also, I may add, of Darwin and "Kant—which appear to me inadequate."

Chapter I. states in excellent terms the problem of philosophy as conceived by the author, and sums up the distinctions between science proper and philosophy proper as follows:

"Firstly, science deals with objects as such, philosophy with the knowledge of "objects. Secondly, science assumes that real knowledge is possible, philosophy "inquires into the truth of that assumption. Thirdly, science deals with the rela- "tions of objects to one another, philosophy with their relations to existence as a

[1] It may seem trivial, but it will perhaps be helpful in the correction of a possible second edition of the translation to state, that in a footnote on page 521, Vol. 2, *flagellatæ* and *dinoflagellatæ* should be *flagellata* and *dinoflagellata*.

"whole. More shortly, science treats of modes of existence, philosophy of exist-"ence in its completeness."

Chapter II. treats of the Philosophy of August Comte, where it appears that Comte's doctrine of the relativity of knowledge rests upon a fundamental contradiction separating "existence into two mutually exclusive parts, the phenomenal and the real," and assuming "two opposite kinds of intelligence." The two assumptions, according to Professor Watson, are self-contradictory. He proposes "to start from the principle that there is one intelligible universe and one kind of intelligence." Chapters III., IV., V., and VI. treat of the Philosophy of Nature, including, respectively, Geometry, Arithmetic and Algebra, the Physical Sciences, and Biological science. Professor Watson's discussions here are elucidative and exhibit very distinctly the weak points of Mill's view, that the formal sciences rest upon experience, in its restricted sense. In the discussion of biological science, the author chiefly considers "whether accepting the theory of development as the only "tenable explanation of the characteristics and changes of living beings, we have "reached an ultimate explanation, or whether we have only solved a subordinate "problem." The author's opinion is that "the world is in no sense a product of "chance, but must be conceived from the point of view of immanent teleology." Chapter VII. treats of the Relations of Biology and Philosophy; Chapter VIII. of the Philosophy of the Mind; Chapters IX., X., and XI. of Moral Philosophy; and Chapter XII. of the Philosophy of the Absolute—a treatment, it will be seen, which accords with the author's rough division of existence into the three great related spheres, of nature, mind, and ego. Although this division may for some purpose or other be economical and convenient one, it is nevertheless one which demands its justification as the outcome of a philosophical system, and not as its postulate.

In the main, the positions which Professor Watson takes in his criticisms of the three thinkers that figure in the title of his book, are strong. We may observe that Darwin is mentioned in the Table of Contents, (which does not seem to have been prepared by the author,) as "an unsophisticated scientific man," and also that a passage from *The Tempest* is incorrectly stated as being from *Midsummer Night's Dream.*

T. J. McC.

DER GEIST DER NEUEREN PHILOSOPHIE. By *Robert Schellwien.* Leipsic: Alfred Janssen. 1895. Pages, 163. Price, M. 2.40.

It is difficult to get at Mr. Schellwien's ideas, which are much mixed with platitudes, and not altogether free from obscurity. Human consciousness, he says, has as its necessary and immutable presupposition unconsciousness; it can arise only by proceeding from unconsciousness. All knowledge of man, therefore, is the abolition of non-knowledge. Of the advance from unconsciousness to consciousness, from non-knowledge to knowledge the fundamental form is the relation of subject and object, where subject is contrasted to object but seeks always to annihilate that opposition. Here the *negative* character of knowledge is exhibited. In self-con-

scious man the subject is perceived as the absolute and knowledge as identical with existence, but not without the negative aspect that the subject is absolute only in so far as it is the agent of a creative mimicry, or mimicking creation, of existence, and knowledge only the *ideal* equation of Being. Again, all knowledge comes from and goes back into individual minds. Therefore, if the progressive development of knowledge, the spirit of the thought of a time, is to be understood, our understanding of it must be sought in the individual spirits from whence it took its new trend of development. Such are the systems of the great philosophers which Mr. Schellwien has undertaken to study in the light, and as corroborations, of his views, beginning with Spinoza, whose philosophy, after the author's formal introduction, takes up the bulk of this first part. *μ.*

PRENOZIONI DI FILOSOFIA SCIENTIFICA. By *Prof. Carlo Salvadori.* Montegiorgio: Ugolino Delbello. 1894. Pages, 312. Price, L. 3.

This little volume is designed as a text-book of elementary philosophy for students in lyceums and colleges. It professes to give no more than mere hints, *accenni*, on the subjects which it treats, and might be compared to the manuals which are widely used in German universities under the name of "encyclopædias"—works giving bird's-eye views, skeleton-outlines, definitions, etc., of the subjects treated. The general idea of the book is excellent. According to the more modern point of view it begins with psychology and ends with logic and ethics. Under Psychology Professor Salvadori treats man's mental nature in all its comprehensive entirety, relegating to logic and ethics only what is included under those heads in their restricted sense. The author is unusually well acquainted with the philosophical and scientific literature of England, France, and Germany, and has made valuable use of the results of the most recent writers of those countries. Upon the whole, he has produced a concise, useful, and suggestive little manual, in a line where such books are much needed. *μκρκ.*

PHILOSOPHIE UND ERKENNTNISTHEORIE. By *Dr. Ludwig Busse.* Leipsic: S. Hirzel. 1894. Pp. 288.

The philosophical investigations which form the body of this work grew up in Japan in connexion with the lectures and exercises which Dr. Busse conducted while Professor of Philosophy in the Teikoku Daigaku, the Imperial University, at Tokio, and are dedicated to his old Japanese students. The book possesses not a little of interest through this association, as many will be desirous to know what manner of philosophy is provided to the young men of that rising nation. Dr. Busse is now Privatdocent of Philosophy in Marburg, Germany. The three teachers whom he cites as his masters, and as having furnished the stimulus to his thought, are Lotze, Kant, and Hume; but he has borrowed nothing from these men, he claims, that he has not made thoroughly his own, so that his philosophy is entitled to independent rank.

Dr. Busse aims to find some tenable position, in the struggle now waging between dogmatic philosophy and the critical theories of knowledge respecting the possibility of metaphysics. Man is a dogmatist, he contends, by birth and nature. The ingenuous clown sees and thinks the world as it appears to him, and no scepticism can dissuade him from his convictions. Even the doubt of the philosopher is based upon the ineradicable dogmatic prejudice that his doubting thought is true. If my doubt, as Descartes said, like my thought, proves my existence, it also proves the validity of my thought, for that is always assumed in the doubt. Now, belief in the objective validity of necessary thought is the assumption on which all metaphysics rests, and the point at which it is attacked by its opponents. And since that very belief and confidence in reason lies also at the basis of the scepticism which the critics of knowledge offer, the attempt is naturally in order, to investigate the position of these opponents of metaphysics, and to show to what extent they have made use of the very dogmatic and metaphysical prejudice which they combat. It may turn out, as Kant has said, that they never think but they lapse themselves into metaphysical affirmations.

This investigation forms the subject of the first part of Dr. Busse's book. His method is to analyse the assertions of the anti-metaphysicians, and to develop their consequences, so as to reach the final assumptions on which they rest. Those assumptions are then probed and their own dogmatic and metaphysical character laid bare. Thus he shows that the denial of the possibility of truth is itself a procedure which presupposes the truth and validity of the laws of thought and consequently nullifies its own results; in a word, the very attempt to establish scepticism nullifies scepticism. In a similar way he proceeds to consider idealism, subjectivism, phenomenalism, etc., as forms of modified or conditional scepticism. He then takes up the critical and transcendental philosophies. In all, he finds that the anti-metaphysical speculations are vitiated by the very notions and methods which they profess to reject. A criticism of reason by reason is impossible in the sense of determining the possibility of objective metaphysical knowledge. To prove metaphysics impossible is itself impossible. Reason is incompetent to criticise reason. Epistemology, as a theory of the nature and origin of knowledge and of its relations to its objects, but as *resting* on metaphysical knowledge, is a possible and important branch of philosophy; epistemology as a critical and *fundamental* science is impossible. Then follows a brief section directed against the theological objections to metaphysics; the dogmatic innate prejudice respecting the validity of reason for all reality needs no assistance nor criticism from theology.

The second part of the work is positive and is devoted to what might be called the "encyclopædic" exposition of the author's philosophy. It gives the outlines of his philosophical system as it takes form under his fundamental assumption of the objective validity of necessary thought, which is shown to be not equivalent to the speculative construction of all reality from pure reason, but admits other independent sources which although not affecting the validity of reason, nevertheless share

with it some of its prerogatives. First, the fundamental constituent elements of reality are ascertained. These are "principles," "facts," and "values," which cannot be expressed one in terms of another. Secondly, philosophy, as universal science, or world-wisdom, is divided into theoretical philosophy, which determines the nature of existence, into practical philosophy which investigates the so-called "values," and into religious philosophy which unites the results of both in the Absolute. This division is made on the ground of Kant's simple formulation of philosophy as consisting of the answers to three questions: "What can I know? What shall I do? What may I hope for?" Here all the questions are discussed that are usually classified under these three heads in the philosophical systems. The third part, which is not yet published, will go more into the details of the criticism of the traditional systems, which in this book is only indicated. μκρκ.

RICHARD AVENARIUS' BIOMECHANISCHE GRUNDLEGUNG DER NEUEN ALLGEMEINEN ERKENNTNISSTHEORIE, EINE EINFÜHRUNG IN DIE "KRITIK DER REINEN ERFAHRUNG." By *Friedrich Carstanjen*. München: Theodor Ackermann. 1894. Pp., 129. Price, M. 3.

According to Mr. Carstanjen, the *Kritik der reinen Erfahrung* of Prof. R. Avenarius marks a crisis in modern philosophical thought, being unique in all epistemological literature. That work consists of two parts: a biological part and a psychological part. In the first, a biomechanics is developed in which the process of cognition is reduced *in toto* to biological phenomena, being a complete doctrine of the changes and groups of changes of the central nervous organ according to purely logical points of view and wholly apart from the assumption of "psychical factors" of any sort whatever. Part II. is psychological, being devoted to the description and classification of the *Aussagewerte*, or predications of the individual as having psychical value. Rising from a broad physiological and anthropological basis a rigid parallelism is established between the changes of the central organ and the contents of the predications, both of which, member for member, are linked together like functions in mathematics are, or rather like the functions of a symbolical logic. The reading of Avenarius's works is a difficult task. His pages bristle with hybrid formulæ and imitations of mathematical nomenclature; and although the time, it seems to us, has not yet come for his commentators, it is perhaps well, just owing to this strange and forbidding physiognomy of his work, that some one should assist the timid student to approach him with confidence and hope. For one of the profoundest thinkers of our era Avenarius is; and tackle him we must, whether at first hand and originally in his own works or through Mr. Carstanjen's Introduction. At any rate, to supply the place of the *magnum opus* itself is not Mr. Carstanjen's intention. That, he says, must be studied by itself; *worked through*, pen in hand, not read through. All Mr. Carstanjen has sought to do is to give his own impression, as a sort of self-satisfaction, hoping that the fruits of his arduous labors will help others. The *résumé* seems to be a trustworthy one. μ.

THE MÂNDÛKYOPANISHAD. With Gaudapâda's Kârikâs and the Bhâshya of S'ankara. Translated into English by *Manilal N. Dvivedi*. Bombay: Tookaram Tatya. 1894. Pp. 188. Price, one and one-half rupee.

Mr. Dvivedi is a well known and acute Hindu writer on philosophy. The present translation of the *Mândûkya* with its several commentaries, was undertaken by him at the request of Col. H. S. Olcott and in behalf of the Bombay Theosophical Publication Fund, generously donated by Mr. Iyer of the Madras High Court. So far as the translator knows the Bhâshya of S'ankara and the Kârikâs of Gaudapâda are not yet rendered into English, and he is satisfied that the Mândûkya itself will be much better understood in the light of those commentaries,—a belief to which the student of the subject will no doubt yield his assent. Mr. Dvivedi has prefixed to the translation an excellent historical and expository introduction of fifty pages, giving a brief *résumé* of the doctrines of the six well-known schools of Indian philosophy with their various tendencies, but chiefly expounding the Advaita system, or philosophy of the absolute. Mr. Dvivedi is a zealous champion of the Advaita[1] system and knows how to connect its formal teachings with all the grave questions of modern society. With regard to the idea of publishing in English translations the records of the acute ancient Indian schools of thought, all scholars will be of the same opinion with Mr. Dvivedi that "it will be proved ere long that the generous gentleman who conceived the idea of accomplishing this work has rendered valuable service to the cause of literature and philosophy in general."

We have also just received a little pamphlet by this author on the Purânas, being a lecture delivered at the International Congress of Orientalists held in Stockholm in 1889. (Leyden: E. J. Brill.) *μ.*

ALLGEMEINE PHYSIOLOGIE. Ein Grundriss der Lehre vom Leben. By *Dr. Max Verworn*, Privatdocent der Physiologie an der medicinischen Facultät der Universität Jena. Jena: G. Fischer. 1895. Pages, 584. Price, 15 M.

"The elementary constituent of *all* living substance and the substratum of *all* "elementary phenomena of life is the cell. If, therefore, physiology finds in the "explanation of vital phenomena its fundamental task, it is plain that *general* phys-"iology can only be a cellular physiology." Such is the thesis which Professor Verworn has placed at the foundation of his exhaustive treatise of *General Physiology*. A cursory glance at its contents will give us the best idea of its import and scope. First, we have a discussion of the aims and methods of physiological research, including a statement of the problem of physiology, the history of its development from ancient times, and a description of modern methods and theories. We shall only stop here to note (1) that Verworn's solution of the problem of body and soul, objectivity and subjectivity, consists in the simple assumption of a *psyche*, of which objects are mere groups of sensations; and (2) that there is no one exclusive

[1] *Advaita* (literally "non-duality") is what we call *Monism*.

physiological method, but that *all* methods are admissible, provided they lead to the *one* physiological goal—the elucidation of life. The second chapter treats of the chemical and physical composition of living substance,—giving the elements of its morphology,—and of life and death ; the third of the elementary phenomena of life, metabolism, cellular development, and the vital forms of energy; the fourth of the present and past conditions of life, biogenesis, and the history of death ; the fifth of cellular irritation ; the sixth and last of the physical machinery of life, cellular mechanics, and the economy of cellular states. The book is a portly one, richly illustrated (268 cuts), and contains full and adequate descriptions of the newest laboratory appliances.

As will be seen, the plan of the work leaves nothing to be desired, in everything that goes to constitute a historical and systematic presentation of the rudiments of general physiology. Much of the material is gathered from scattered and mostly inaccessible sources, and all is subjected to examination under new synthetic points of view. Stress is laid upon the importance of the comparative method as employed by Johannes Müller, to whose memory the work is dedicated. As the task here undertaken has never been attempted before on so extensive a scale and as an organic whole, the author asks his colleagues' forbearance and solicits from them rigorous and outspoken criticism. That criticism, however, is not for us. Professor Verworn's work supplies a profound want in the general literature of this subject, and will be of valuable assistance, by its easy style, not only to students and professors of physiology, but also to the cultured reader and scientist generally, be he philosopher or physician, botanist, zoölogist, or what not. It remains to state that Professor Verworn contributed an article to *The Monist*, somewhat over a year ago (April, 1894), on "Modern Physiology," which he has incorporated in the present work, and to which the reader may be referred for a succinct statement of his views. μκρκ.

A History of Mathematics. By *Florian Cajori, Ph. D.* New York and London : Macmillan & Co. 1895. Pages, 422. Price, $3.50.

There is no subject with which history as a rule is so little associated, nor any which in some of its parts derives so much profit from it, as mathematics. The history, for example, of the origin and growth of the calculus of variations is imperatively necessary to a profound apprehension of its principles. The chief function, however, of the history of mathematics, as a constituent of instruction, or collateral reading, is the stimulus which flows from the human and romantic features that adhere in such variety and number to the development of the science, as also the heuristic glimpses which it affords of the way in which knowledge generally is constituted. Intellectually nothing could be more refreshing than the anecdotes which De Morgan, say, recounts in his mathematical biographies of the wit and idiosyncrasies of the giants of mathematical thought, and physically, no doubt, many a lean-faced pangeometric youth will be spurred on to wholesome athletic efforts by

the story of the thirteen duels which John Bolyai accepted, fought, and won successively with the mere interlude of a violin-solo. On the other hand, although neither our use nor our understanding of logarithms is helped by the knowledge that Napier conceived the idea of them before exponents were used, and developed them wholly from geometrical and fluxional considerations, yet as an indication of the way in which science has grown up, nothing could be more instructive.

On the first of these points Professor Cajori lays some stress, not omitting to emphasise also the importance of the history of mathematics as a repository of the errors of the past, which if known can be avoided.

Professor Cajori's book is, as he calls it, a *brief general* history of mathematics. One must not expect to find in it a new treatment nor the embodiment of new views regarding the theory or the mode of development of knowledge. He relies, on this score, and especially in the earlier parts of the work, on the books and opinions of other investigators rather than on the subject-matter itself, and in some instances is uncritical on the philosophical side of the questions. For example, on that old *crux*, Why the Greeks made no progress in Mechanics, Physics, etc., he cites Whewell's theory that it was due to their not having "distinct and appropriate ideas"; which, since that is the very problem, is not calculated to throw much light on the ancient stagnancy in science. Perhaps, also, more references to the literature which contests the philosophical foundations of the Gauss and Riemann mathematical metaphysics might be given, for nothing, perhaps, needs more the curb of philosophical criticism than just this branch of speculation. But a small book cannot be an encyclopædia of the formal sciences, and our remarks, far from aspersing the character and merit of Professor Cajori's work, will go merely to show its scope and purpose. Its style is vivid and terse, and in mechanical execution and arrangement of matter the book attains a high standard. Undoubtedly, as a manual and handy book of reference it will fulfil an important office. More especially is this true of the chapter entitled "Recent Times," where, in contradistinction to the early history, much valuable information has been brought together which could hardly be found elsewhere in so compact a form, if at all, in any one book. This is its really valuable feature. It remains to be added, and as forcibly as possibly, that for a book designed "to be acceptable to teachers and students" the price is much too high, and that apparently without justification. T. J. McCormack.

Psychology for Teachers. By *C. Lloyd Morgan*, Principal of University College, Bristol. London: Edward Arnold. Pages, 251. Price, 3s. 6d. net.

The greater part of the fundamental doctrines of this latest book of Professor Morgan's are contained in his *Introduction to Comparative Psychology*, reviewed by us in the last *Monist*; and all the excellent qualities of lucidity and animation which marked that work are again displayed here. The book is designed for teachers and aims to show, by a running exposition of the salient points of psychology, how the practical problems of education can be elucidated and furthered by attention to the

results of scientific analysis. The charm of the book lies in the fluency and vivacity of the author's style, as in the breadth and naturalness of his interests. What is offered us are not vague generalisations, but doctrines and facts which appeal to our familiar and best experience. The ten chapters which constitute the book are entitled as follows: States of Consciousness, Association, Experience, Perception, Analysis and Generalisation, Description and Explanation, Mental Development, Language and Thought, Literature, Character and Conduct. Skilful is Professor Morgan's use in these expositions of the idea of a "focus" and "margin" of consciousness, and of the idea of a "mental background." The chapter on literature is admirable, and itself a striking witness of that union of scientific grasp with literary appreciation which the author commends. This book is by long odds the best popular work for persons beginning the subject of pedagogy which we know of, and one which certainly no practical teacher can afford to leave unread. It constituted originally a course of lectures delivered in Edinburgh in connexion with the Summer School of Art and Science, and it should also be mentioned perhaps that Dr. J. G. Fitch, late one of Her Majesty's Chief Inspectors of Training Colleges, has supplied to the book a commendatory preface. T. J. McC.

LECTURES ON HUMAN AND ANIMAL PSYCHOLOGY. By *Wilhelm Wundt*. Translated from the Second German Edition by *J. E. Creighton* and *E. B. Titchener*. London: Swan Sonnenschein & Co. New York: Macmillan & Co. 1894. Pages, 454. Price, $4.00.

The work from which this translation has been made is the revised and enlarged edition (1892) of Wundt's early popular lectures on psychology, published when the science was merely a "programme for the future" (1862) and necessarily in a very incomplete condition. The present volume, which is substantially a new and modern work, will serve a good purpose in instruction, as an intermediate reading between the first elements and the more technical treatises. The translators, who are two assistant professors in the University of Cornell, have acquitted themselves creditably of their arduous task, and it is to be hoped that their success and experience will encourage them to undertake the translation of Wundt's larger work—than which they could render the world no greater service. A superficial glance shows a few oversights in the book. The velocity of light is given (p. 92) as "42,100 miles" in a second, where *German* miles not English miles are meant. Also (p. 93) the ambiguous term "billions" might have been replaced by "millions of millions," or by figures. On p. 1 and elsewhere "natural philosophy," which in English commonly means "physics," and not "philosophy of nature" in the German sense, hardly gives the right contrast to "natural science." As regards the typography, it was certainly ill-advised to retain the cuts with the German color-designations, when they might have been replaced at a very small cost. The work should also have had an index. μκρκ.

STUDIES FROM THE YALE PSYCHOLOGICAL LABORATORY. Edited by *Edward W. Scripture, Ph. D.*, Instructor in Experimental Psychology, Yale University, New Haven, Conn. Pages, 124. Price, $1.00.

The "studies" of this little volume constitute the second year's work of the Yale Psychological Laboratory. They are chiefly by Mr. Scripture, the contents being as follows: On mean values for direct measurements, by E. W. Scripture; Researches on the mental and physical development of school-children, by J. Allen Gilbert; Remarks on Dr. Gilbert's article, by E. W. Scripture; Experiments on the highest audible tone, by E. W. Scripture and H. F. Smith; On the education of muscular control and power, by E. W. Scripture, T. L. Smith, and E. M. Brown; A psychological method of determining the blind-spot, by E. W. Scripture; Tests of mental ability as exhibited in fencing, by E. W. Scripture. Mr. Scripture's discussion of errors in measurement leaves nothing to be desired in point of mathematical ornamentation. He has submitted his conclusions to three mathematicians, each of whom dissents at some point from his deductions. He says, however, that any value this article may have "is due to their patient labor with one who is not a "mathematician but who is obliged to use mathematical means to solve practical "problems." Dr. Gilbert's researches on the development of school children present some interesting results, as do also "Tests of mental ability as exhibited in fencing." Mr. Scripture finds "that fencing does not develop mental quickness "more than scientific pursuits, but it does develop to a high degree the rapidity of "executing movements." μ.

SUBSTANCE AND ITS ATTRIBUTES. London: Kegan Paul, Trench, Trübner, & Co., Ltd. 1895. Pages, 197.

The task which the author of this anonymous work has assailed is by no means a puny one, although he has attempted it within a relatively modest compass. He has "eviscerated," he claims, the inherent attributes of primitive and essential substance, contending, properly enough, and not advancing the idea for the first time in the history of philosophy, that substance without attributes is a contradiction in terms. He has "defined," after his manner, the expressions "spirit" and "matter," tracing their consanguinity and connexion to what he takes to be their obvious natural source. He has also pointed out the "precise source and foundation of physical forces," and that, also, after a manner of his own. He has "manifested" the basis of life, "fairly analysed and formally promulged" the great law of causality, and discovered nothing less than a definite foundation for the ego or soul of man as essentially a spirit-entity. He has given "a fresh representation of the Absolute," which bears its *epitheton ornans* well, propounded a scheme of psychology, which he recommends for "its simplicity and harmony with facts," and, finally, he tells us it will be a sufficient reward and a cause of much rejoicing to him if he shall have contributed in the least by his book to throw down and destroy "one of the most complicated and most mischievous structures ever built up by the

" perverted ingenuity of man—the *a priori* schemes of Kantian and Hegelian tran-
"scendentalism," which he characterises as a terrible incubus that has too long enthralled philosophy. Add to this a batch of theological conceptions, which receive putative explanation here, and we shall have approximately the contents of this work. It is a mechanical ontology which has issued from the insight lately offered by science, that most physical phenomena can be represented as modifications of a hypothetical substance called the ether. The ether is the " Universal Sub-
"stance which exists as an *ens* by itself, which is the absolute basis of all beinghood, " which is uncreated, infinite, eternal, without parts, all-pervading, unseen, that "cannot be displaced, and withal impersonal." As this ether can be anything and everything, the development of a full-fledged ontology from it and a consequent solution of all possible problems offers no material difficulties. But more significant than being just one of the thousand fanciful and possible developments of this insight, it is not. T. J. McC.

MENTAL DEVELOPMENT IN THE CHILD AND THE RACE. Methods and Processes By *James Mark Baldwin, M. A., Ph. D.*, Stuart Professor of Psychology in Princeton University. With Seventeen Figures and Ten Tables. New York and London: Macmillan & Co. 1895. Pages, 496. Price, $2.60.

"Every philosopher who becomes a father," said Max Müller once, "imagines himself *de ipso facto* in possession of the secrets of the origin of language and mind"—or, at least something to that effect. Professor Baldwin justly repudiates this disparaging insinuation, and with commendable heroism and an indomitable zeal for the truth accepts the derogatory epithet of "nursery psychologist" as a badge of honorable service and merit. None the less, Professor Baldwin is perfectly aware of the enormous difficulties and dangers which attend the investigations of this subject, which may be safely said to be still in its infancy. In fact, it is difficult to escape noticing here and there, a tinge of scepticism and despondency in the author's voice, as he lingers before that 'dark backward and abysm' of the early human mind—especially when he is confronted with the appalling diminutiveness of his predecessors' results. If such expressions escape him, however, they have purely a regulative function, and far from despairing of ultimate partial success—for otherwise he would not have written the book—Professor Baldwin is sanguine that rich and valuable results will be obtained, in fact has obtained them. When well into his own work, a cheerful optimism and confidence inspires him.

Professor Baldwin has opened up a new line of inquiry, and pursued it under a new method—"the dynamogenic method," which we shall speak of later. First as to the origin and contents of the book. Professor Baldwin began his work with simple *observations* on infants, which he published off and on in the scientific periodicals. On coming to the subject of child's imitations, however, especially in relation to volition, he was so deeply impressed with the *genetic* function of imitation as to feel compelled to entertain a widened view of the subject and to work out a theory of

mental development in the child on a new and considerably modified plan. That plan involved the consideration of a doctrine of the race-development of consciousness—the great problem of the evolution of mind. The first chapters, I–VI, are devoted to the statement of the genetic problem, with reports of the facts of infant life and the methods of investigating them, and also to what he calls the mere "teasing out" of the strings of law on which the facts are beaded—principles of suggestion, habit, accommodation, etc. Here the central problem of motor adaptation is considered. "Chapter V. gives a detailed analysis of one voluntary function, Handwriting. Then follows the theory of Adaptation, stated in general terms in Chapters VII. and VIII.; and afterwards comes a genetic view in detail (Chaps. IX. to XVI.) of the progress of mental development in its great stages, Memory, Association, Attention, Thought, Self-consciousness, Volition. So the whole is a whole, the theory resting upon an induction of facts (put before it) and supported by the deduction of facts (put after)." Professor Baldwin emphasises the bearing which his results will have on education and more especially on social or collective psychology, where the genetic theory will find "both its root and its ripe fruitage." He proposes, however, to take up this aspect in another work which shall bear the sub-title *Interpretations : Educational, Social, and Ethical*, in contrast to *Methods and Processes*, by which the present volume is described.

We may stop to note the author's philosophical position, which falls, he says, under the very indefinite category of "ethical or spiritual idealism." For example, concerning the explanation of consciousness or reason by evolution, the author takes the stand, now quite common among philosophers, "that the natural history "question is not the same as the question of the essence or nature or explanation "of mind. Philosophy has its problem just the same, however consciousness arose, "and no amount of evolution theory can settle the problem set by philosophy." In fact, Professor Baldwin has serious doubts regarding the personal qualifications and even the good intentions of the biologists. "One almost despairs of them!" he says. And, again, regarding their puffed-up disinclination (for their hearts have been made fat and their ears heavy by the fulsome praises of the age), regarding their puffed-up disinclination to listen to "the plaintive note of one who but tries to interpret the wail of the human babe"—he slyly remarks: "But I am not prepared to dispute the point [the possibility of their listening] with any of my readers who find such an expectation quite too optimistic," All in all, the poor biologist comes in for some pretty hard hitting.

Respecting the advantages which Professor Baldwin cites as belonging to this subject: in the first place, infant psychology meets the urgent needs of mental analysis, in fact, is the only means of testing the truth of our mental analyses; we find in the child the elements of mind in the simplest human form. Again the phenomena of the infant consciousness are simple as opposed to reflective, and there is also a corresponding simplicity on the organic side. Lastly, in the list of advantages, a more direct application of the experimental method is possible in observing young

children. As to the dangers of abuse of infant psychology it is to be noted: (1) that "we can fix no absolute time in the history of the mind at which a certain mental function takes its rise"; (2) "that the possibility of the occurrence of a mental phenomenon must be distinguished from its necessity"; (3) "that it follows from the principle of growth itself only that the order of development of the mental functions is constant"; and (4) "that discrimination and criticism should be both strenuously cultivated and employed.

In the discussion of ontogenesis and phylogenesis, on the relation of which the motive idea of the book hinges, Professor Baldwin points out what he thinks is a "valuable distinction" for the interpretation of animal action. Taking the four stages of the child's experience of persons not himself; the objective, where the persons are merely sensations; the projective, where they are simply impersonated or individualised but not yet ensouled; the subjective, where he discovers himself; and the ejective, where he makes persons not himself *like* himself;—taking these four stages, he claims that no evident analogy in the animal series has been pointed out by other writers for what is here called the projective stage, but that such phenomena as the "gregarious instinct" cannot be accounted for except on the assumption of such an epoch of animal consciousness. By this distinction Professor Baldwin claims that he eliminates what is called the "psychologist's fallacy," habitual with naturalists.

As to the validity of the biological theory of recapitulation we are invited to note "very marked modifications of the race-record in the growth of the individual." "It is evident that while the organism develops serially in regular stages, yet often "the stages in the individual's growth represent directly later stages in the series "of animal structures, without having passed through all the earlier stages."

Finally, a word remains as to the author's new method. The methods heretofore employed have involved complex elements and roundabout paths of nervous transmission which greatly vitiate the results. Professor Baldwin has sought "to "reach a method of child study of such a character as to yield a series of experiments "whose results would be in terms of the most fundamental motor reactions of the "infant, which could be easily and pleasantly conducted and which would be of wide "application." The organ of reaction selected is the hand, which seems to be the most sensitive, direct, and active of all. He claims that "the infant's hand-movements in reaching and grasping are the best index of the kind and intensity of its sensory experiences." The dynamogenic method is the one which the author has preferred before all others in the experiments to which it is adapted, which he has developed as his own, and which has yielded him rich results. He has collected a list of his new observations in an appendix which shows at a glance their scope and thoroughness. The book is interspersed with much homiletic and educational matter, anecdotes of his children, etc., which relieve the monotony of the psychological development and enforce the author's theoretical positions. Professor Baldwin's book is written in a comparatively untechnical but withal precise style, and although

constituting one of the "sources" of the subject, it is by no means beyond the reach of the average educated reader. T. J. McC.

GEHIRN UND SEELE. Ein Vortrag gehalten bei der 66. Versammlung deutscher Naturforscher und Aerzte in Wien am 26. September, 1894, von *August Forel*, Professor an der Universität Zürich. Bonn: Emil Strauss. 1894. Pp. 32. Price, M. 1.

The attitude of the myriad workers in the broad domain of modern knowledge, although professedly directed at a common goal, is mostly one of narrowness and hostility, due to mutual misunderstandings. The highest ideals of humanity as incorporated in philosophy, religion, science, ethics, and æsthetics, which are parts only of a harmonious whole, are rent with passions and prejudices, and appear to the dispassionate spectator as mere caricatures of their higher selves. It is to compose these misunderstandings, and to correct this disfigurement that Professor Forel has attempted in the above brief address to throw what light he can on one of the most significant and most knotty of ancient differences, the relation between the brain and the soul. His attempt is made in the form of a *résumé* of the most recent researches in cerebral and nervous physiology with the addition of philosophical criticisms based mainly on the work of Kant and Spencer. He has taken a broad view of the questions and looked at them in their widest significance, making a strong appeal for the recognition and emphasis of their ethical and religious consequences. Especially does he insist upon the necessity of a philosophical elaboration of the results of science, claiming that such results have no significance except as related to the organic whole of knowledge. His reflexions show, he thinks, how intimately the study of the human cerebral soul is connected with all branches of human knowledge, and how eminently fitted it is to guard thinkers and inquirers against the dangers of narrowness and error. They lead, moreover, to a monistic view of the world capable of reconciling true religion and ethics with science, and constitute powerful weapons against the increasing social decadence of the age. The reputation of the author makes the recommendation of this brief pamphlet superfluous; it need only be said that students of all branches will find here important and suggestive hints on a variety of topics. μ.

WEGWEISER ZU EINER PSYCHOLOGIE DES GERUCHES. By *Dr. phil. Carl Max Giessler*. Hamburg and Leipsic: Leopold Voss. 1894. Pp., 79.

The author emphasises the difficulties which attend experiments with the organ of smell, which in its present neglected state does not seem very well fitted for the reception of delicate olfactory impressions. Disclaiming the intention of writing a complete psychology of smell, he discusses the effects of olfactory impressions upon the mental and physical life of individuals, showing that the psychical life of whole classes of lower orders of animals is bound up with their sense of smell, and that for the spiritual life of man the sense of smell is of an importance not to be under-

rated, as also that it exercises a great influence upon the mental development, being a factor hitherto much neglected. This is partly shown by the isolation which has been gradually effected, of all trades, professions, and duties from which disagreeable odors emanate. These considerations lead to a classification of smells, in this respect, as idealising and disidealising. Idealising smells are important factors in the development of the soul. The author finds a corroboration of his view in the biblical story of Creation, where God blew the breath of life into man's nostrils instead of into his mouth, *wherefore* man became a living soul. But on this point the author has evidently mistaken the connexion of the two facts. μ.

ÆSTHETIC PRINCIPLES. By *Henry Rutgers Marshall, M.A.* New York and London: Macmillan & Co. 1895. Pages, 201. Price, $1.25.

In his larger treatise, *Pain, Pleasure, and Æsthetics*, published a short time ago, Mr. Marshall gave the technical and psychological foundations of his new views on the theoretical principles of æsthetics. He has sought to put together now in this smaller work his more general and more interesting results and such as are of most *practical value* in reference to the study of æsthetics. It is written in a popular style and appeals to less critical and less learned readers. The book covers six chapters. In the first and second chapters the author studies the nature of æsthetic effect in the observer; in the third chapter, the nature of the impulse that compels the artist to undertake his work; in the fourth chapter, the nature of the critical act and of the standards used when we assume the critical attitude; in the fifth and sixth, algedonic æsthetics, including negative and positive principles. Mr. Marshall writes a plain and simple English and has mingled with his æsthetical expositions numerous moral and artistic reflexions of great value. His book deserves to find a wide circle of readers, and, harmoniously with its subject, has received a pretty and appropriate external dress. The substance of the work was delivered as a course of lectures under the auspices of the Trustees of Columbia College, New York. T. J. McC.

PERIODICALS.

THE PSYCHOLOGICAL REVIEW. VOL. II. No. 3.

PRELIMINARY REPORT ON IMITATION. By *Josiah Royce.*—STUDIES FROM THE PRINCETON LABORATORY (I.–V.): I. Memory for Square-Size: *J. Mark Baldwin* and *W. J. Shaw*; II. Further Experiments on Memory for Square-Size: *H. C. Warren* and *W. J. Shaw*; III. The Effect of Size-Contrast Upon Judgments of Position in the Retinal Field: *J. Mark Baldwin*; IV. Types of Reaction; *J. Mark Baldwin.* assisted by *W. J. Shaw*; Sensations of Rotation: *H. C. Warren.*—SHORTER CONTRIBUTIONS: The "Haunted-Swing" Illusion: *H. C. Wood*; Heat-Sensations in the Teeth: *H. R. Marshall.*—DISCUSSION.—(New York and London: Macmillan & Co.)

THE AMERICAN JOURNAL OF PSYCHOLOGY. Vol. VI. No. 4.

COMPARATIVE OBSERVATIONS ON THE INDIRECT COLOR RANGE OF CHILDREN, ADULTS, AND ADULTS TRAINED IN COLOR. By *George W. A. Luckey.*—MINOR STUDIES FROM THE PSYCHOLOGICAL LABORATORY OF CORNELL UNIVERSITY: Taste Dreams: *E. B. Titchener*; On the Quantitative Determination of an Optical Illusion: *R. Watanabe, Ph. D.*; The Cutaneous Estimation of Open and Filled Space: *C. S. Parrish*; The Daily Life of a Protozoan, A Study in Comparative Psycho-physiology: *C. F. Hodge, Ph. D.*, and *H. Austin Aikins, Ph. D.*—MINOR STUDIES FROM THE PSYCHOLOGICAL LABORATORY OF CLARK UNIVERSITY: A Study of Individual Psychology: *Caroline Miles*; The Memory After-Image and Attention: *Arthur H. Daniels. Ph. D.*; On the Least Observable Interval Between Stimuli Addressed to Disparate Senses and to Different Organs of the Same Sense: *Alice J. Hamlin*; Notes on New Apparatus: *Edmund C. Sanford.*—ON THE WORDS FOR "ANGER" IN CERTAIN LANGUAGES; A STUDY IN LINGUISTIC PSYCHOLOGY. By *A. F. Chamberlain. Ph. D.*—A LABORATORY COURSE IN PHYSIOLOGICAL PSYCHOLOGY; THE VISUAL PERCEPTION OF SPACE. By *Edmund C. Sanford.*—PROCEEDINGS OF THE THIRD ANNUAL MEETING OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION AT PRINCETON. — PSYCHOLOGICAL LITERATURE.—(Worcester, Mass.: J. H. Orpha.)

THE PHILOSOPHICAL REVIEW. Vol. IV. Nos. 2 and 3.

THE PRIORITY OF INNER EXPERIENCE. By *Dr. Warner Fite.*—FICHTE'S CONCEPTION OF GOD. By *Dr. J. A. Leighton.*—THE DOCTRINE OF CONSCIOUS ELEMENTS. By *Miss E. B. Talbot.*—DISCUSSIONS: I. Professor Fraser's

Account of "Human Intelligence": *Prof. J. E. Creighton*; II. The Motor Power of Ideas: *Dr. Herbert Nichols*; III. The Elench of the Liar: *Hiram M. Stanley*.—Book Reviews.

Agnosticism. By *President J. G. Schurman*.—The Ethical System of Richard Cumberland. By *Dr. Ernest Albee*.—Descartes and Modern Theories of Emotion. By *Dr. David Irons*.—Discussions: I. The Consciousness of Moral Obligation: *William W. Carlile*; II. Professor Ormond's "Basal Concepts in Philosophy": *Prof. Archibald Alexander*.—Book Reviews.—(Boston, New York, Chicago: Ginn & Co.)

INTERNATIONAL JOURNAL OF ETHICS. Vol. V. No. 3.

Self-assertion and Self Denial. By *J. S. Mackenzie*.—Moral Forces in Dealing with the Labor Question. By *William M. Salter*.—The Ethical Consequences of the Doctrine of Immortality. By *W. Lutoslawski*.—Philosophical Sin. By *Henry Charles Lea*.—National Character and Classicism in Italian Ethics. By *Luigi Ferri*.—The Motives to Moral Conduct. By *A. Döring*.—Discussions.—Book Reviews.—(Philadelphia: International Journal of Ethics, 1305 Arch Street.)

MIND. NEW SERIES, No. 14.

The Philosophy of Common Sense. By *Prof. Sidgwick*.—Nature of Inference in Hindu Logic. By *S. N. Gupta*.—On the Supposed Uselessness of the Soul. By *F. H. Bradley*.—Emotions versus Pleasure-Pain. By *H. R. Marshall*.—On the Relation of Accommodation and Convergence to Our Sense of Depth. By *E. T. Dixon*.—Reality and Causation. (II.). By *W. Carlile*.—In What Sense Are Psychical States Extended? By *F. H. Bradley*.—Discussions, etc.—(London and Edinburgh: Williams & Norgate.)

REVUE DE MÉTAPHYSIQUE ET DE MORALE. Vol. III. Nos. 2 and 3.

Esquisses de philosophie critique. I. De la nature des choses. By *A. Spir*.—La sociologie: ses conditions d'existence, son importance scientifique et philosophique. By *M. Bernes*.—La logique de Hegel: la science de la notion. By *G. Noël*.—Etudes critiques.

La philosophie de Charles Secrétan. By *E. Boutroux*.—Des axiomes mathématiques. By *G. Riquier*.—De la resemblance et de la contiguité dans l'association des idées By *Ch. Dumont*.—Etudes critiques.—(Paris: Librairie Hachette et Cie.)

REVUE PHILOSOPHIQUE. Vol. XX. No. 3, 4, and 5.

Sur la méthode de la sociologie. By (*M.*) *Bernès*.—La Psychologie du musicien. IV. De l'Intelligence musicale et de ses conditions objectives. By (*L.*) *Dauriac*.—Recherches expérimentales sur les différents types d'images. By *Dugas*.

L'ancienne et les nouvelles géométries. IV. Les axiomes et postulats de la géométrie de l'espace homogène. By *J. Delbœuf*.—Sur la méthode de la sociologie. (Concluded.) By *M. Bernès*.—La mémoire musicale. By *L. Dauriac*.

LES ABUS DE L'INCONNAISSABLE EN MORALE. By *F. Fouillée.*—KANT COMME SAVANT. By *G. Milhaud.*—SUR L'ORIGINE SENSORIELLE DES NOTIONS MÉCANIQUES. By *Clémentitch de Engelmeyer.*—ANALYSES ET COMPTES RENDUS, ETC.—(Paris: Felix Alcan.)

ARCHIV FÜR SYSTEMATISCHE PHILOSOPHIE. Vol. I. No. 2.

ZUR THEORIE DER BEOBACHTUNG (II.). By *B. Erdmann.*—ANALYTISCH UND SYNTHETISCH. By *E. Kühnemann.*—KRITISCHE STUDIEN ÜBER DIE GRUNDLEGENDEN PRINCIPIEN DER MECHANIK. By *H. Petrini* in Upsala.—HISTORISMUS UND RATIONALISMUS (I.). By *F. Toennies.*—(Berlin: George Reimer.)

VIERTELJAHRSSCHRIFT FÜR WISSENSCHAFTLICHE PHILOSOPHIE. Vol. XIX. No 2.

BEMERKUNGEN ZUM BEGRIFF DES GEGENSTANDES DER PSYCHOLOGIE (IV. Concluded). By *R. Avenarius.*—DAS GESETZ DER EINDEUTIGKEIT. By *J. Petzoldt.*—UEBER DIE REALITÄT DES ZWECKBEGRIFFS. By *J. Goldfriedrich.* (Leipsic: O. R. Reisland.)

ZEITSCHRIFT FÜR PSYCHOLOGIE UND PHYSIOLOGIE DER SINNESORGANE. Vol. VIII. Nos. 6 and 7.

UEBER DIE RÜCKWIRKUNG DER GESICHTSEMPFINDUNGEN AUF DAS PHYSISCHE UND DAS PSYCHISCHE LEBEN. By *E. Raehlmann.*—UEBER DIE BEZIEHUNG DER ATMUNG ZUR PSYCHISCHEN THÄTIGKEIT. *S. Landmann.*

ZUR LEHRE VON DEN OPTISCHEN TÄUSCHUNGEN. UEBER KONTRAST UND KONFLUXION. By *F. C. Müller-Lyer.*—DIE SPONTANE UMWANDLUNG DER NACHBILDER DER SONNE IN REGULÄRE SECHSECKE ODER ACHTECKE. By *Gustav Wagner.*—LITTERATURBERICHT.—(Hamburg and Leipsic: Leopold Voss.)

ZEITSCHRIFT FÜR PHILOSOPHIE UND PHILOSOPHISCHE KRITIK, Vol. CVI. No. 1.

C. W. OPZOOMER By *Van der Wyck.*—DER WERTBEGRIFF UND DER LUSTWERT. By *Ed. von Hartmann.*—IMMANUEL KANT UND ALEXANDER VON HUMBOLDT (I.). By *P. von Lind.*—ZUR WÜRDIGUNG DER PHILOSOPHISCHEN STELLUNG BACONS VON VERULAM. By *Dr. W. Schmidt.*—EINIGE BEMERKUNGEN ÜBER DIE ENTWICKELUNG DER LOTZESCHEN ZEITLEHRE. By *R. Geijer.*—MORITZ CARRIERE†. By *P. von Lind.*—RECENSIONEN.—(Leipsic: C. E. M. Pfeffer.)

PHILOSOPHISCHES JAHRBUCH. Vol. VIII. No. 2.

UEBER ZIEL UND METHODE DER RECHTSPHILOSOPHIE. By *Von Hertling.*—DER PARSISMUS. By *P. Schanz.*—DIE ARISTOTELISCHE MATERIALURSACHE (Continued). By *J. Reitz.*—DIE WIRTHSCHAFTSPOLITIK DES VATER UNSER (NACH G. RUHLAND) VON GUTBERLET.—RECENSIONEN.—(Fulda: Fuldaer Actien-Druckerei.)

APPENDIX TO THE MONIST, VOL. 5, NO. 2.

DE RERUM NATURA

TRANSLATED FROM THE GERMAN BY

CHARLES ALVA LANE

THE ORIGINAL APPEARED IN "PHILOSOPHISCHE MONATSHEFTE, VOL. XXX, NOS. 5 AND 6.

CHICAGO:
THE OPEN COURT PUBLISHING COMPANY
1895

DE RERUM NATURA.

I. THE PROBLEM.

WHEN thought, to comprehend the universe
Strains outward, holy awe enthrills the soul.
With reverence only dare we lift the eye
To front the congregation of the worlds,—
The All of life, ensouling suns and motes,
That since the measureless eternities,
Obedient to the cosmoplastic laws,
In rhythmic throes of palingenesis,
Creates new worlds of those destroyed. With awe
O Cosmos! doth he contemplate thy ways
Whose peering glass surveys the teeming heaven.
Before the mystery that in thee lives
Bewildered stands the grey philosopher.
Thou like the ocean art, from whose abyss
Wave upon wave majestically swells
To sink again adown the darksome sea.

Upon thy bank, Ocean of Worlds, behold
The poet musing stands! What longings stir
His dreamy heart! and as in prayer, the soul

With full devotion rings harmoniously!
Yet through his hallowed mood of worship jars
The discord of the doubter's questionings:
"And wilt thou venture it, th' impossible,
"To celebrate in song the infinite?
"How shalt thou praise the universe, forsooth,
"On which millenniums have tired themselves
"With probings after truth? The Sciences
"A pæan are, whose cadences unfold
"In richer numbers than thy harp can yield—
"A hymn whose notes seraphic are the souls
"Who loftiest rise from out humanity."

Yea, but emotions yearn for utterance
When I the order contemplate which rules,
And with unfailing, sleepless law the love
And hatred sways of atoms numberless,—
The order that enthralleth every part
To service of the whole, till nebulas
To systems grow of constellated worlds,—
The order, too, whose governance directs
The budding race of cells to unity,
Allotting so the labor of the whole,
That organisms deftly shape themselves.

"And this thou laudest?" 'rose the bitter voice
That fain the poet's cosmic psalm would hush,
"Forget not then how Justice smiteth him
"Who, finding not his duty to the whole,

"In restive selfhood shirks. Inexorably
"The guiltless with the guilty feel the smart."

That know I well, for life hath shown to me
How much of misery the heart may hold.
Ay, every effort is with grief entwined
And anxious care. Without the battle's brunt,
No victory; and every conflict brings
Its wounds. But lo! a goal forever lures
And woos the weariness of toiling feet
Around a centre dreamed of, but unseen.
I know it well, yet have I also found
That pain's tuition is ennobling life,
And our endeavor gives to toil its worth.
In equal measure Nature suffering doles
With pleasure's sweetening apportionment;
And only he who lives is doomed to die.
And this is justice, therefore murmur not.
An even risk all preference besets.
With equity's unbending sternness ever
And with impartial love are we embraced.
The burden must be sore that winneth worth.
Yet what thou suff'rest in the press of strife,
Thou must submit to for humanity
Which liveth in thy heart, inspiring thee
The goal to win that shimmers to thy dream,
And goading thee life's mysteries to solve.
When I the nameless misery behold
That trembles through the individual soul,

And though my work in idle piecemeal lay,
I upward look and consolation seek
In cosmic Unity's eternal bliss.
Then hope, a-yearn within my bosom, saith:
Lo, every dissonance must be attuned
If thou the pulsing harmony wouldst hear
That swelleth from the chorded galaxies.

Let not the insufficiency of self
Mislead: being a part, thou serv'st the whole.
Permit not that thy aspirations flag,
Of weariness and tribulation galled.
When in death's agony thy heart must break,
When day declines and light of consciousness,
Do not, O heart, despair! for thou remainest
Within the bosom of the All. The stream
That finds the sea meets not extinction there.
In transitoriness is life accursed;
But transient, too, are all our cares and griefs.
When silence darkens round the failing breath
The evils vanish that disquiet us,
And death, life's holy consummation, brings
The benison of immortality.

II. THE SOUL.

Here am I, imaged in the glass of Self,
And eager in desire to dare and do.
Life, warm and pulsing, tingles in my veins,
And restlessly thought's lightning flashes dart.
Pause thee, O Soul, and think upon thyself!
What art thou, then, and whence dost darkling come?
What goal is luring, and the purpose what
That to thy strivings consecration gives?
Declare thy nature to thyself, O Soul,
And read thy features in awareness traced.

Kaleidoscopic splendors haunt mine eye,
Picturing ambient Nature's shifting shapes,
And through mine ear pierce tonal messages.
Each sense its typical investment weaves,
Which, wrapt in mem'ry's immortality,
Shall rise anon like Lazarus untombed.
From out commercing excitations, bred
Of interfused sensations manifold,
The staple forms of concepts crystallise,
To union drawn by psychic kindredship.
As thought with kindred thought conjoins, behold
How lucid grows the rising realm of mind!
The restlessness which here for action yearns,
Gains aim and purpose; regulated are

The tangled contraries of promptings wild
In calm tranquillity of self-control.

What wildering manifoldness! yet how all
In multitudinous unity entwined,
Creates the glorious fashion of the soul!
And this I call my Self. What cadencing
Of tones! what odor-sensing! what rare life!
And all, yea all, hath meaning: what befalls
Denoteth streams and forests and the stars,
Denoteth brothers, joys and racking pains,
Denoteth struggle, wrath and enemies.
The pictures and ideas symbols are
Revealing to the Self its own Beyond.

Beyond I hear the clangor of the world;
But only in myself the voices range.
Beyond, a glim'ring panorama lures;
But in mine eye the compassed picture lies.
Thus ever do a thousand subtle threads
Me intercatenate with that strange world
Wherein I move. I contemplate the Vision:
Of me it is a part. I am the All;
Yet that somewhat which into self hath grown
Is of the world a part: This bides, I pass.
But lo! e'en then, in that which unto me
The not-I seemed, I evermore endure.

Erewhile I came to birth; the gathered lore
Of tome and sense and life's wide school I've sought.

Declare my place or ever life I knew.
Am I from nothing come, to lapse again
Into nonentity? Nay, into form
Have I been fashioned, and the mould I know
Wherein the features of my Self were wrought.
Not from the blank Inane emerged the soul :
A sacred treasury it is of dreams
And deeds that built the present from the past,
Adding thereto its own experiences.
Ancestral lives are seeing in mine eyes,
Their hearing listeneth within mine ears,
And in my hand their strength is plied again.
Speech came, a rich consignment from the past,
Each word aglow with wondrous spirit life,
Thus building up my soul of myriad souls.

I call that something "I" which seems my soul ;
Yet more the spirit is than ego holds.
For lo ! this ego, where shall it be sought?
I'm wont to say "I see"; yet 'tis the eye
That sees, and seeing, kind'leth in the thought
The beaming images of memory.
"I hear" we say: Hearing is of the ear ;
And where the caught word stirs, there cords resound
Of slumb'ring sentiment ; and echoes wake
Of sounds that long ago to silence lapsed.
Not dead, perfected only, is the past ;
And ever from the darkness of the grave
It rises to rejuvenated life.

The "I" is but a name to clothe withal
The clustered mass that now my being forms.
Take not the symbol for reality—
The transient for th' eterne. Mine ego, lo!
'Tis but my spirit's scintillating play
This fluctuant moment of eternities
That now are crossing where my heart's blood beats.
I was not, am, and soon will pass. But never
My soul shall cease; the breeding ages aye
Shall know its life. All that the past bequeathed,
And all that life hath added unto me,
This shall endure in immortality.

And if the welling spring of spirit-life
I seek, where but in Nature is it found—
In that great All whose tiny part I am?
Yea, holy Nature stampeth into me
Its being's galaxy of wondrous forms;
Thus after its own likeness fash'ning me.

Something there is eternal in the world
Of change, in all the tides of motion moveless.
Law? God? the Logos wouldst thou call it, which
From the beginning was? Name as thou wilt:
In ceaseless flux it faithful to itself
Remains, ubiquitous, determining all
In unavoidable necessity.
When I in order would the chaos set
Of inexhaustible experiences

Reflected in the facets of the sense,
This calm unchanging entity I seek,
And trace my bearings in the restless world.
Th' eternal Voice in reason echoeth,
Which like a compass in our voyagings,
Directs thro' oceans unexplored.

Great All!

O, thou all-comprehensive infinite!
In no ambiguous language speakest thou,
In no uncertain promptings teachest duty.
Thy governance doth in the atom live,
And in the spheric courses of the stars.
Thou fountain whence the beauteous Order springs!
To thee, too, sentient creatures owe their being,
Whom thy warm breath ennobling quickeneth.
Here potent aspirations upward yearn,
As spurning nature's lowly elements.
Thou formest in the soul an empire new
Where thou thy dispensation dost portray.
Thou givest light, and following its gleam,
We grope for paths of truth. Thou art the judge,
And thou the measure, too, of justice art.
In thee all motion of becoming is;
In thee its motive and its purpose rule.
What from thee springs not alien is to thee;
And life in thee its only aim can find.
Thy breath it is which warmly thro' it thrills;
It is thy light that gloweth in the soul.

Into undreamed-of fathoms of thy depth,
O great Creator-power!—into thy bosom
Shall man return. Restless in life, in thee
He finds the holy, termless rest again.

Yea, in this rest which doth remain to us
As life's last aim and refuge evermore—
In this great glory of release from self,
This blissful apotheosis of life,
In this which never was not, and shall be—
Th' immutable amid the changeful All,—
In this my soul its biding-place shall find.
Thus all my deeds, my pains, my strivings here
With confidence are shaded. This holy spell
Which haunts presagefully the yearning world,
Shall strength amidst my toilings bring to me;
To brother-love shall rouse and charity;
To benedictions on my foes shall prompt;
In fortune it shall cheer, in sorrow soothe;
The key to all the riddles it shall yield
Which compass me about; shall show the light
Wherein life's tragedies transfigured glow;
To thought such vast interpretations it
Shall lend, that Nature's tones will all accord;
That hatred will in love be overwhelmed,
And rapturous fruition compensate
For all the pains our upward-strivings bring.
This source of spirit-life, in death's despite,
Holds heritance of immortality.

III. THE ALL.

Not dead is matter, though inert it seem.
A hidden life ensouls the eternal mass,
Which ever into quickened forms evolves.
Think not that spirit-germs consignments are
From alien realms of transcendental being :
In matter immanent, their nascent life,
From ancient darkness struggling, seeks the day.
Divinely noble thought, the crowning flower
That on the World-tree grows, concealed hath lain
Within vivific virtues of its root.
An upward impulse penetrates the All,
And nothing is that aspiration lacks.

The torture of the longing who can gauge
That calleth ever out of gravity
For tactual companionship's caress ?
Who knows how congregated atoms thrill
With love's delight, e'en where our feeble eye
But dust in stark inertness contemplates ?

Thus slowly through the fathomless expanse,
In isolated desolation, drift
The ancient fragments of disrupted worlds ;
When lo ! from out the neighb'ring fields of space,
The silver wooings of our sun are flashed.

The errant atoms wax in their desires;
And fleeter, ever fleeter, sunward speeding,
They kindle into mystic comet-fire,
Whose flame our far-off firmament reflects.
Dismayed are all the superstitious tribe
Of frightened folk. Of war and pestilence
False prophets prate, of famine and distress,
And eke the fronting hour of final doom.
Only with gladness thrills the tipler's heart
In fancied foretaste of the comet's touch
Upon the favored season's vintage cast.
But from the world's commotion all aloof,
The astronomer, with raptured vision, stands
And marks the midnight's fiery wanderer.
The spectrum catches tokens from his light
Of elemental kindredship with earth,
And fancy hints of ancient dwellers there.
With eager glass the astronomer attends
The trav'ller's sun surrounding course, and maps
With careful scale, the leadings of the path
That outward bears to distant voids again.
With flagging pace and breath that wanes of fire,
The lonely wand'rer wends. But in his heart
A dream of resurrection sleeps. What time
He yearneth for a larger life, whereto
His single power cannot attain, behold
From distant scopes, where universes teem,
An errant comrade, as by chance appears.
By gravitation's mutual greetings lured,

They quit their courses, and, with gath'ring speed,
Impetuous to collision rush. Space pulses
With awful thunders where they meet, and night
Is raptured with a dream of fire. And now,
With gravitative searchings through the Vast
Their doubled mass, with wider ordinance,
More night-embosomed comets summons forth.
Responding spaces yield their homeless broods.
With wild delight from every side they rush,
And glowing in their passionate embrace,
Illumine flamingly the regions round.

O Light, in beauty's holy guise begot
Through atom-motions kissing in their play!
Art thou requited love's surprising child?
Or art thou of the progeny of war
Whose passion, wrought to zeal igniferous,
Dissolveth all to fiery turbulence
Of gaseous hurricanes a-whirl? Perhaps
We greet thee best as toil-engendered boon;
For, after wanderings orderless and dark,
A common will the meeting atoms ply;
Their immemorial desires at length
To candent life in quick fruition flash,
Burning the night from space.

There still prevails
A chaos wild of contravening storms:
The fiery masses interpenetrant

Are seething as in Bacchic revelry.
Wider and wider in their mazy gyres
The glowing circles spin, till lo! at last
Their currents mix in one vast vortex-whirl
To mould anon a pageantry of worlds.
Amid the chaos infant Order breathes.
In swift revolvency the planets sweep
As fiery spheres about the central sun,
Whose sovereignty as vassals they obey.
But where the cooling surface darkens round,
Impending vapors loose their liquid stores;
Seas surge with thund'rous tides against the rocks,
And over all an airy heaven hangs.

Albeit the elements divided are,
For closer union evermore they strive,
And where, in faithful love connubial
They blend, cells quicken in the pregnant sod.
The tender germs unfold their gath'ring life
And teem a myriad hordes, after their kind.
The promptings of affinity beget
A living growth of co-aptative forms,
Where, with reciprocative laborings
Of complemental functions, they may move
With nobler rule amid the elements.
A higher life is piercing into being:
From night's sensationless rigidity,
Precursor of a spiritual day,
The kindling light of consciousness doth gleam.

The multiplying tribes of living forms,
In struggle for existence, ever toil,
Till all the world a plain of battle grows,
Creature to creature dealing doom of death,
For hunger's or for passion's goading sake.
But keener and of larger use the sway
Of whetted powers becomes that ply the strife;
And ever the appropriated gain,
In stern heredity's bequeathment held,
From generation unto generation,
Following fast, is yielded to the years;
And though for rest a-yearn, the failing lives
Of ancient ages lapsed to death's dark realm,
Their aspirations and their toils endure:
The soul of all their being liveth yet
In lives their lives projected hitherward.

The soul's day breaketh. Consciousness appears
With clearing light, and Reason learns at last
Her powers to marshal and her realms to rule.
In pleasing modulations language rings,
Like speech of gods, to ears initiate. Here
The poets find their rhythmic ravishment;
Here, too, desire, for knowledge all athirst,
In never-sating draughts her fever feeds;
And, borrowing illumination here,
Abyssmal depths the spirit penetrates,
Where, wrapt in mystic silences and glooms,
The slumb'ring secrets of creation lie.

Transfiguring th' unfolding universe,
Cognition's sunbeams spread and glow.
They bring to ignorance, whose feeble eyes,
By superstition's lowering clouds are dimmed,
A lore assuasive of celestial truth ;
And unto error's night, that, prison-like,
Encompasseth th' aspiring soul of man,
The promise of deliverance they bear
From false illusion's lures and mockeries.

O holy sun, in all the circling host
Of bleak and darkened worlds, with touch benign,
Light, warmth, and thrilling life awakening,
Thyself for others willingly thou givest
In sacrifice, and pourest forth thy gifts
Unstintedly to all the needful worlds ;
Nor reckest thou if thanks thy largess greet,
If ingrate fools reject thine offering,
Or evil-doers warp its sacred use.
For others dost thou live, for others die.
So he that would the world illumine gives
Himself, his heart-blood freely yielding up.
The thorny crown resignedly he wears ;
The martyr's scourging suffers and the taunts,
And on the cross finds ignominious death.
For this the glorious radiance of his life
Longeth again to find the ancient night.
For all the world it offered up itself,
And findeth in surcease of labor peace.

As wintry years around the cooling sun
Fold darkening, life faileth on the worlds.
An arctic desolation everywhere
To heedless heavens appeals despairingly.
The wedging frosts dispart the shapely spheres,
And drifting fragments mark the erstwhile worlds.
With widening distances space presses in
The sundered masses to estrange, till lo!
Across the voids as comet-forms they range.

But as the morning ever wakes the eyes
Whose weariness the evening sealed with sleep;
As never life the doom of death can thwart,
(Though genial resurgence foils the tomb
With life rejuvenised in serial birth);
As night and day, in alternating layers,
From time unfold: so too the world respires:
The tides of life in rhythmic surges rise,
Ever to ebb in restless billows back
Where call the soundless Deeps; then upward heave
With gathered stress of nobler life again.
Thus ever from the grave is life redeemed,
And ruins wake to spheres regenerate,
Gemming the circle of eternity
With threaded universes evermore.

THE SOUL.

ALLEGORY.

THE primal property of sentient life
That comes with protoplasmic body formed
Is strange endowment of awareness deft,
Of action and reaction when the self
Collides in force with world environment—
A gift that in becoming ages grows
To reason's stature, where all wisdom glows.

Heredity, the gift of life in plant,
By which the past descends to present time,
Is wed in love with young Awareness fair,
And from the source of life an issue springs
Of troops of memories, on angel wings.

Anon the sequent generations come
And like with like in matrimony join,
Whose offspring fill the world with fays of Sense;
Who fare the earth on wings of rainbow light,
Or ride the air on strains of music sweet,
Or sail on perfume o'er the sea of cloud,

Or journey far on cars of flavor wrought,
Or on the feet of touch through gardens roam
Where violets and roses keep their home.

Sensations come in generations vast;
And friendships dear among the varied forms
E'er grow by sweet propinquity to love;
And from the depths of love fair percepts spring—
A host of fairies of a higher life
Who ride on thoughts through world of peace and strife.

Anon perceptions multiply with time,
Of world's activity and deeds of self,
Till lovely deed and mighty act are joined
In holy wedlock's sacred bonds of thought.
Then percepts sire an Understanding host
Of giants armed with force and energy,
In panoply of universal laws,
And coursing steeds of universal cause.

The giants wed and genii appear—
Reflexions wise that ken the past and now—
And prophesy the history of world,
Emblazoned on the tome of present time:
A light to read the ages coming on,
The tale of time in glyphs of æons gone.

So fays and fairies, giants, genii,
Fill all the world enwalled by orbs of light

With many magic denizens of mind—
A world that fills all space and yet leaves room
For myriad worlds of symbol-teeming mind
That miracle the souls of all mankind.

SONG.

O, whence come the forces of mind,
The agencies potent of good?
O, whence come the thoughts of mankind,
With errors so vainly withstood?

Each soul is in focus of world
Where forces are constantly hurled,
And cosmos external and real
Creates in the soul an ideal.

For there transformation is wrought,
Where forces are changed into thought,
Responding to cosmical thrill
Or turned into deed of the will.

SOUL FORCES.

The vast phenomena above the world—
In heaven high, with all its stars unfurled,
Whose very rest is motion on through space,
Unceasing change their sole enduring base,
While thrilling the heart with emotion enwrought
And filling the mind with a river of thought—
Fore'er to man all make appeal,
And beckon on to woe or weal.

The vast phenomena spread o'er the land,
Abroad on blooming plain and mountain grand,
Where lofty cliff defends the nestling lea
And cloud as river runs to join the sea,
Where poet is charmed with the story concealed
And sage is allured by the vision revealed,—
Have all a tale to stir the soul
And lure the man to higher goal.

And all phenomena of ocean vast,—
In unknown depth, too great for plummet cast,
Or shallow sea, where verdant islands smile,
Or inlet, where the swelling hills beguile,
Where sailor is borne o'er the wind-driven waves,
Where tempest disports, or the hurricane raves,—
All tell a wondrous tale to man,
His listening soul to bless or ban.

Phenomena of subterranean deeps,—
Where fierce volcanic fire in silence sleeps,
Or roars in earthquake, bursts in lava stream,
And fills the trembling land with fright supreme,
Where treasure of silver and gold may be found
And interlocked crystalline jewels abound,—
Appeal to every realm of soul
The mind and will of psychic whole.

With swarming life the atmosphere is filled,
And microscopic forms have task to build

A world of life beneath the azure dome—
The star-decked tent for every wanderer's home ;
And waters are filled with minute living forms
That ride on the billows and dance with the storms :
To hosts that live the sight beyond—
To all these lives—must man respond.

And all the plants spread o'er the bounteous earth,
Where sequent fruit rewards the blossom's birth,
And forest clothes the mountain with delight,
And prairie blooms in beatific sight,—
Where mosses are found in the shady retreat
And lichens are spread in the rime and the heat,—
Commune with man, who roams for years
O'er hill of smiles and vale of tears.

The stellate beings that inhabit sea
And hosts whose stranded homes bedeck the key,
The tribes in blooming copse and meadow seen,
Who sport cuirass of gold and helmet green,—
The fishes that swim and the reptiles that crawl,
The beast and the carolling bird over all,—
In being live to signal man
And play their part in psychic plan.

And loving, hating, acting, thinking men
Pour out their living words with tongue and pen,
Till thought enthrills the world from zone to zone
And sways the crowd, or stirs the sage alone.

Each soul of the world is a star source of thought—
And still but a learner, by other souls taught :—
Environed by all human kind—
Environment of every mind.

For man has invented a magical art,
In league with the pulsating air,
With symbolling speech to unbosom the heart,
Revealing the thought nestled there.

And symbols of symbols in defter design
He graves on the tomes of the world,
Till faraway *theres* are brought *here* to recline,
All *thens* to the *now* are unfurled.

SONG.

O, what are the powers of soul
To cope with the forces of earth !
The levin and tempest control—
The ocean that dances in mirth !

Yet soul is the master of all ;
Ideal is ruler supreme,
And forces obey its still call,
Though uttered in only a dream.

Sublime are the gifts of the soul—
Endowments of opulent life
Displayed on eternity's roll
In symbols of aid or of strife.

AWARENESS.

The soul is harp on which the cosmos plays—
With conscious chords for multitudinous lays—
A song of raptured love in tender notes,
A hymn that o'er the balmy evening floats,
A charge that the deed may be daringly done,
A pæan for victory brilliantly won,
Or dirge on direful day of doom,
When love is buried deep in tomb.

MEMORY.

The soul is treasure-house of cosmos grand,
For jewels brought from sky and sea and land;
Displayed in beauty all the worlds appear
As universal lore that dights the seer;
For stars in their splendor are limnéd in thought,
And seas in their turbulence quietly caught,
And vale and hill and mountain high
Are there illumed for mental eye.

SENSATION

The soul is Pilot grey on sea of lore,
Where barques of Touch are sent from every shore,
And brigs of savor bearing fruits of earth,
And boats of odor born of Blossom birth,
And carvels of music from choirs in air,

And clippers of light from the stellary glare,
And sloops that come from ports of life
With joys and pains of inner strife.

PERCEPTION.

The soul is skilled Interpreter of world,
To render into thought the signs unfurled
Throughout illumined sky and murky deep
And subterranean realms where earthquakes sleep—
The meteor flash and the nebular gleam,
The cloud on the mount and the turbulent stream,
The cavern with its pillars grand
Orb-peopled sky and sea and land.

UNDERSTANDING.

The Soul is wise discoverer of cause,
Who sees revealed in form the guiding laws,
And journeys far to realms beyond the here,
And kens the sounds that never come to ear,—
Ariding the waves of activity's sea,
Exploring the lands where the forces are free,
Where fount of youth forever flows
And tree of truth forever grows.

REFLEXION.

The soul is deft artificer of thought,
Who carves the blocks from cosmic quarries brought
In symbol glyphs of universal form,

In correspondence true to cosmic norm;
And the history read in the glow and the gloom
Is story of living from cradle to tomb,
With joys and pains and hopes and fears
And deeds that fill the rolling years.

ACCEPTION.

The soul is temple built of spoken blocks;
Its deep foundation laid in living rocks;
Its walls combine experiential lore,
As thought and thought are hewn forevermore.
The dome is of reason of heavenly hue,
On arches that symbol the good and the true.
Pavilions stand to guard them all,
And wisdom glints the turrets tall.

INTROSPECTION.

The soul is a harp, I remember,
Whose vibrating chords are of consciousness spun,
And Cosmos forever is harper,
Who strolls down the ages emeasured by sun,
With song of the mighty becoming—
A pæan to star-worlds for victory won.

The soul of the soul is a gittern
That echoes the harp in its cosmic refrain,
Its strings of self-consciousness woven,
Responsive in tremulous whispering strain,

Like voice of a delicate conscience,
Adjudging the issues of pleasure and pain.

As ambient air bears the music
From pulsating viol to listening ear,
So memory carries the pæan
To tremulous gittern in hope or in fear;
For soul of the soul is the gittern,
Still murmuring melody joyful or drear.

CONCEPTION.

The soul is Universe of thought and will,
In concepts grouped of judgments wrought in skill,
The like with like in wise discrimination,
The formal joined in deftest integration,
The acting united in skilful causation,
The sequent combined in a wise derivation,
And all in one idea cast:
The universal concept vast.

The mind and will as dual parts in whole
Unite to constitute the human soul,
External true and good to comprehend,
The false and foul that ever o'er it pend:
The true and the right in the conscience supernal,
The false and the wrong in the doing infernal;
To know environment is mind;
To know to do is will in kind.

With certitude or hesitating doubt
Each soul responds to every change without,
In bitter turbulence or sweet repose;
From duplex soul a double answer goes:
For life of the soul is reply to the sign;
To whispering impulses action benign;
To asking mind an answer meet;
To loving heart response complete.

A mind diseased may haste the truth to spurn,
And then for love may bitter hate return;
A halting will in mighty deed may fail
(Alas, such psychic maladies prevail!);
While death of the soul is the failure to send
Response to the signal of foe or of friend;
For soul unthrilled by cosmic choirs,
As eye unpulsed by light, expires.

As passive bell receives the blow betimes
And active rings the mellow wedding chimes,
As passive germ receives the golden light
And active spreads a lily to the sight,
The soul that responds to the symbols of truth
And ponders in age as it pulses in youth
Is passive while the world enthrills
And active as it thinks and wills.

THE MIND.

The mind is Architect with cosmic force
To gather all from its primeval source;

The creature then creator comes to be,
And builds of psychic forms immensity—
A cosmical world of concepts enwrought,
The symbol parts fitted of integrant thought;
A psychocosm by mind begot,
Where matter, space, and time are not.

The heart of mind is judgment-seat to feel
The bitter pain of woe, the joy of weal,—
Ancestral heritage to guard the way
Through peril born of night or glare of day.
Emotion is judgment experience brings,
The wisdom of time on cognitional wings—
An angel's warning given to man
That all the world will boon or ban.

THE WILL.

The will is Engineer, with might sublime
To yoke the energies of space and time
As slaves to toil for every human need,
And servants trained to render each his meed;
No power so subtle but learns to obey,
No forces so mighty but yield to the sway;
Alcyone bestows her light
And Amazon his rolling might.

The will is skilful choice of deed to do
When world collides with self in action true,
Responding with the apt and juster deed,

A full supply for every human need ;
And wisely and truly to play the good rôle,
Through highways and byways a guide to the soul,
When wisdom dwells in human ken
And justice lives with wiser men.

The heart of will is fruit from tree of life,
That kens the good of love and ill of strife,—
The deftest function of the human soul
A pledge to honest self-control ;
For feeling is knowing the good and the ill,
The conscience responding to cosmical thrill
That ever plays through human heart
In life informed by psychic art.

The fickle wind from north or south may blow ;
From east or west ; its ban or boon bestow ;
And beat the boat past every sheltering loch
Adrift till wave shall dash it on the rock,
Where breaker is lashing the headland with foam
And gull soars adown from its beetle-browed home—
But nay, the sail transmutes them all,
To waft the barque where loved ones call.

So will transmutes the universal force
To breeze that speeds the barque on chosen course ;
For soul is barque on life's tempestuous sea,
Asail from strand of birth to death's dark key,
Where breezes are wafting to sheltering loch,

Or hurricanes driving to breaker-lashed rock ;
But will as sail controls them all,
To waft the soul where loved ones call.

BECOMING OF SOUL.

The mind becomes by increments minute
Of judgments built, as block on block is laid
From quarries brought unnumbered as the sands,
And all arranged with skill in memory's store—
An opulence of universal lore.

They come! they come! these deeply-freighted ships—
On rolling sea of lore, from all the world,
With symbol blocks in symbol ships asail
Forever coming in the calm and storm ;
While pilot grey, Sensation, guides them all
To mystic wharf of cosmic treasure-house,
Where all the symbol cargoes, deftly stored,
Are grouped, the like with like, in wisdom's hoard.

Perception, skilled Interpreter of world,
Receiving cargoes from afar,
Endowed with deft experiential skill,
Selects the fitting block for every part
And, all in hands of wise Interpreter,
The magic symbols are conceptual wrought,
In structure deft of wisely fitting form,
Conforming just to universal norm.

Then Understanding hoary, Seer of force,
Inspires the symbol-forms with wealth of life
And makes them living blocks of energy,
In concepts wise of universal force,
The elements of soul in psychic mode
Obedient to laws of cosmic code.

Reflection, deft Artificer of thought,
Combines the living blocks in sequent groups
Along the lines that lead from sure effect
To antecedent cause in depths of time,
In concepts true of world—becoming change,
Where germs of Now are stored in cosmic grange.

At last the Architect, the mighty Mind,
Unites them all in universal whole:
The concepts wrought by Sense in sorted class,
The systematic grouping of all thought;
The concepts wrought by deft Perception's skill
Conforming just to all the forms of world;
The concepts wrought by Understanding wise,
Of force and energy and cause of deed;
The concepts wrought by calm Reflexion's might,
Of serried ages of becoming thought;
In world-view vast embracing all in one
Of stars and æons measured by the sun.

The Will as engineer, with might sublime—
The twin of mind combined by miracle—

Is fain to join in great Creator's work
And lend his aid to task of building world.
And, trained by Mind in laws of primal time,
That guide the course of evolution vast,
Volition makes a better world for man,
Conforming still to universal plan.

Not into gloom of introverted self,
But out to cosmic realm, he gazes far,
Illumined ever by eternal light,
Inspired by hope to win a better day,
Informed by love to find a better way.

Thus Will transforms the world to meet his need
And then reforms the self to higher law,
Forgetting death in faith of life eterne,
Forgetting pleasure sweet in quest of love,
And filled with joy at beatific truth,
Whose coronet is everlasting youth.

J. W. Powell.

BINDING SECT. SEP 21 1964

B
1
M7
v.5

The Monist

PLEASE DO NOT REMOVE
SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO
LIBRARY